COMSUBLANT/COMSUBPACINST 5400.29 W/CH 1
74/
03 MAR 1997

COMSUBLANT/COMSUBPAC INSTRUCTION 5400.29 W/CH 1

Subj: STANDARD SUBMARINE NAVIGATION/OPERATIONS DEPARTMENT ORGANIZATION AND REGULATION MANUAL (NODORM)

Ref: (a) OPNAVINST 3120.32 Organization and Regulations of the US Navy
(b) COMSUBLANT/COMSUBPACINST 5400.38 (SSORM)(SSBN) and COMSUBLANT/COMSUBPACINST 5400.39 (SSORM)(SSN)
(c) COMSUBLANT/COMSUBPACINST C5400.14 (SSN SOP)/Ship Systems Manual (SSM) for 688 Class/Ship System Manual (SSM) for SSBN 726 class
(d) COMSUBLANT/COMSUBPACINST C3500.1A Training Manual
(e) OPNAVINST 4790.4C 3-M Manual
(f) OPNAVINST 5510.1H Information and Personnel Security Program Regulation Manual
(g) COMSUBLANTINST 3140.1B/COMSUBPACINST S3530.28 Charts and Publications Allowances
(h) DMA Catalog of Maps Charts and related Products, Part 2-Hydrographic Products
(i) COMSUBLANT/COMSUBPACINST 4720.1 Procedures and Responsibilities for Alterations to Strategic Weapons System Equipment
(j) COMSUBLANT/COMSUBPACINST 4790.4A Submarine Force Maintenance Manual
(k) COMSUBLANT/COMSUBPACINST 8102.2A Nuclear Weapons Manual
(l) U.S. Navy Regulations
(m) OPNAVINST 3100.7 Ship’s Deck Log

Encl: (1) Standard Submarine Navigation/Operations Department Organization and Regulations Manual (NODORM)

1. **Purpose**. To provide a standardized Navigation/Operations Department Organization and Regulations Manual (NODORM) for use by submarines of the U.S. Atlantic and Pacific Submarine Force.

2. **Cancellation**. COMSUBLANT/COMSUBPACINST 5400.28A, COMSUBLANT/COMSUBPACINST 5400.46.

3. **Summary of Changes**. This revision incorporates the former NORM and ODORM into one manual that supports reorganization of the administrative and watchstanding structure of the NAVOPS Department onboard U.S. Navy submarines required by the Electronics Technician rating consolidation.

4. **Action**.

a. Replace COMSUBLANT/COMSUBPAC Instructions 5400.28A and 5400.46 with enclosure (1).

b. Implement the organizational changes directed by enclosure (1)

5. **Policy**. Departmental organization and administrative procedures have the ultimate purpose of developing a high degree of operational readiness. Policies, derived from the application of standard administrative principles

are supplied by enclosure (1). This instruction does not supersede any official instruction relating to technical or operating procedures, or safety precautions. The procedures in this manual are promulgated in the interest of providing uniformity to basic submarine NAVOPS Department procedures throughout the Submarine Force.

6. **Implementation**. Each Commanding Officer shall ensure that this manual is promulgated to the NAVOPS Department of his command. Each Navigator shall ensure that all NAVOPS Department personnel are familiar with its contents. The Department shall then be organized and administered accordingly.

7. **Changes to the manual**. To maintain uniformity, the following procedures are prescribed.

a. Recommended changes to this manual shall be forwarded to COMSUBLANT or COMSUBPAC (N7) for approval and issue on a Force-wide basis.

b. Local ship changes are authorized when necessary to tailor the basic instruction to a ship's particular design or configuration. A copy of the local change shall be forwarded to COMSUBLANT (700) and COMSUBPAC (70).

c. Advance Change Notices (ACNs) will be promulgated when necessary. ACNs will be serially numbered (e.g., ACN 3/1). The first number will be the consecutive number used to account for ACNs issued between regular changes to the manual. The second number will be the number of the next (unissued) change to the manual. The promulgation of the next regular manual change will cancel and incorporate all ACNs outstanding as of the change issue date.

8. **Effective Date**. This instruction is effective upon receipt. It becomes the ship's NAVOPS Department Organization Manual when so promulgated by the Commanding Officer.

C. L. MUNNS
Chief of Staff

J. G. HENRY
Chief of Staff

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U. S. ATLANTIC FLEET
NORFOLK, VA 23511-5230
AND
COMMANDER SUBMARINE FORCE
U. S. PACIFIC FLEET
PEARL HARBOR, HAWAII 958506550

COMSDBLANT/
COMSUHPACINST 5400.29 CH-1
N74/
28 JUL 1998

COMSUBLANT/COMSUBPAC INSTRUC[redacted] 5400.29 CHANGE TRANSMITTAL 1

Subj: STANDARD SUBMARINE NAVIGATION/OPERATIONS DEPARTMENT ORGANIZATION AND REGULATION MANUAL (NODORM)

Encl: (1) Revised/reprinted pages vi thru viii, x, and I-3 thru I-5, I-15, and II-1 thru 11-14, and II-17 thru 11-20, and IV-7 thru IV-8, IV-10 thru IV-12, IV-14, IV-15, IV-17, IV-20 thru IV-22, and IV-52 thru IV-54, and V-l thru V-44, VI-1 thru VI-3, VI-P thru VI-11 and VI-17, VI-22, VI-26 thru VI-32, and VII-l thru VII-2

1. Pumose. To update and correct information contained in the Standard Submarine Navigation/Operations Department Organization and Regulations Manual (NODORM).

2. Summarv of Changes. This change is a maj.or revision to Chapter V and adds a new Chapter VII. The following is a summary of changes:

a. Incorporates information from ACN l/l and ACN 2/l into the pages of this instruction.

b. Deletes the reference to the Navigation Division Officer from Article 1104.

c. Adds Article 2101 (Navigation Supervisor) and renumbers remaining Articles in Chapter II. Section 1.

d. Revises Article 2113 by changing responsibility for depth gage checks from the Quartermaster of the Watch (QMOW) to the Auxiliary Electrician Forward.

e. Revises Article 4304 (Lookout Qualification Card).

f. Revises Article 5106 (Use of GPS) to require recording vice monitoring of GPS Figure of Merit (FM) and use of DGPS.

g. Adds new Article 5107 (Use of Replicated Charts)

h. Revises Articles 5112 and 5113 (Piloting Preparations and Planned Operations/Navigation Checkoff) to remove requirement for plotting 14nm from land and allows ships to use either 1Onm from land and/or shoal water.

i. Revises Article 6101 (Ship's Deck Log) by deleting the requirement for QMOW/Duty NAV ET to sign the log and adds the requirement to log the stationing, relieving, and securing of the Command Duty Officer (CDO).

j. Revises Article 6103 (Ship Position Log) changing entries for QMOW watch relief.

k. Adds new Article 6121 (Submarine Radar Log) detailing requirements for format and maintenance.

1. Adds Chapter VII (Electronic Navigation Monitoring).

m. Adds reference to the Ring Laser Gyro Navigator (RLGN).

n. Deletes all reference to NAVSAT and Omega navigation systems

o. Includes numerous administrative changes throughout.

3. Action

a. Each Commanding Officer shall ensure that this change is promulgated to the Navigation Department of his command. Each Navigator shall ensure that all officers and Navigation Department personnel are familiar with its content.

b. Replace existing chapters and pages with the new chapters and pages from enclosure (1).

c. Annotate entry of Change 1 on the "Record of Changes" page. File this transmittal directly following the "Record of Changes."

for J. R. HARVEY
Chief of Staff

NILS A. SJOSTRPM
Chief of Staff

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LOCATOR CROSS-REFERENCE SHEET

Subj: PROMULGATION OF NAVIGATION DEPARTMENT ORGANIZATION AND REGULATION MANUAL (NODORM)

1. Enclosure (1) to this directive is not filed in this directive binder, but may be found at the following location:

_____

_____

FILE THIS SHEET WITH COVER DIRECTIVE IN SHIP'S FILES

(THIS PAGE INTENTIONALLY LEFT BLANK)

USS_____ NAVOPSDEPTINST 5400.___

RECORD OF ACKNOWLEDGEMENT

I have read and understand the NAVOPS Department Organization and Regulations Manual, USS _____ NAVOPSDEPTINST 5400._____.

Name	Signature	Date

(THIS PAGE INTENTIONALLY LEFT BLANK)

TABLE OF CONTENTS

TABLE OF CONTENTS (con't)

TABLE OF CONTENTS (cont'd)

TABLE OF CONTENTS (cont'd)

A)

USS_____ NAVOPSDEPTINST 5400.___

RECORD OF CHANGES

CHANGE NUMBER	DATE OF CHANGE	DATE OF ENTRY	SIGNATURE, RANK/RATE OF PERSON MAKING ENTRY
CH-1	28 JUL 98		

LIST OF EFFECTIVE PAGES

PAGE NUMBERS	EFFECTIVE CHANGE
Promulgation Navigation/Operations Organizational & Regulation Manual (NODORM) (pages 1 through 2)	Original
i through v	Original
vi through viii	CH-1
ix	Original
x	CH-1
I-l through I-2	Original
I-3 through I-5	CH-1
I-6 through I-14	Original
I-15	CH-1
I-16 through I-26	Original
II-1 through II-14	CH-1
II-15 through II-16	Original
II-17 through II-20	CH-1
III-I through III-12	Original
IV-1 through IV-6	Original
IV-7 through IV-8	Ch-1
IV- 9	Original
IV-10 through IV-12	CH-1
IV-13	Original
IV-14 through IV-15	CH-1
IV-16	Original
IV-17	CH-1
IV-18 through IV-19	Original
IV-20 through IV-22	CH-1
IV-23 through IV-51	Original
IV-52 through IV-54	CH-1
V-l through V-44	CH-1
VI-I through VI-3	CH-1
VI-4 through VI-8	Original
VI-9 through VI-11	CH-1
VI-12 through VI-16	Original
VI-17	CH-1
VI-18 through VI-21	Original
VI-22	CH-1
VI-23 through VI-25	Original
VI-26 through VI-32	CH-1
VII-l through VII-2	CH-1

Subj: PROMULGATION OF NAVIGATION/OPERATIONS DEPARTMENT ORGANIZATION AND REGULATION MANUAL (NODORM)

Ref: (a) OPNAVINST 3120.32 Organization and Regulations of the US Navy
(b) COMSUBLANT/COMSUBPACINST 5400.38 (SSORM)(SSBN) and COMSUBLANT/COMSUBPACINST 5400.39 (SSORM)(SSN)
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(d) COMSUBLANT/COMSUBPACINST C3500.1A Training Manual
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(f) OPNAVINST 5510.1H Information and Personnel Security Program Regulation Manual
(g) COMSUBLANTINST 3140.1B/COMSUBPACINST S3530.28 Charts and Publications Allowances
(h) DMA Catalog of Maps Charts and related Products, Part 2-Hydrographic Products
(i) COMSUBLANT/COMSUBPACINST 4720.1 Procedures and Responsibilities for Alterations to Strategic Weapons System Equipment
(j) COMSUBLANT/COMSUBPACINST 4790.4A Submarine Force Maintenance Manual
(k) COMSUBLANT/COMSUBPACINST 8102.2A Nuclear Weapons Manual
(l) U.S. Navy Regulations
(m) OPNAVINST 3100.7 Ship’s Deck Log

1. Purpose. The purpose of this instruction is to promulgate the Navigation/Operations Department Organization and Regulations Manual for USS _____. This manual, which supplements references (a) and (b), establishes in detail the organization of the Navigation/Operations Department. Nothing in this manual shall be construed as contravening or superseding references (a), (b) or (c), U.S. Navy Regulations, or any other directive of higher authority. If any contradiction is found between this manual and directives of higher authority, it shall be brought to the attention of the Navigator.

2. Effective. This instruction is effective on _____.

3. Objectives. The following are the principal objectives of this manual:

a. To provide, by means of organizational charts and functional guides, a comprehensive and clearly defined presentation of the department’s organizational structure.

b. To set forth explicitly the duties, responsibilities, limits of authority and organizational relationships of officers and petty officers in the Navigation/Operations Department.

c. To define the responsibilities and qualification requirements of all Navigation/Operations Department watch standers.

d. To establish basic administrative procedures for the Navigation/Operations Department.

e. To supplement references (a) and (b) in setting forth regulations governing individual duties of personnel assigned to the Navigation/Operations Department.

f. To incorporate the procedures and requirements of reference (c) into Navigation/Operations Department logs and records.

USS_____NAVOPSDEPTINST 5400.

Subj: PROMULGATION OF NAVIGATION/OPERATIONS DEPARTMENT ORGANIZATION AND REGULATION MANUAL (NODORM)

4. Compliance. A thorough knowledge of this manual by OODs and personnel assigned to the Navigation/Operations Department or involved in the navigation of the ship is essential to the proper operation of the ship and department. All OODs and each man assigned to the department or involved in the navigation of the ship shall read this manual and the department directives which supplement it prior to assuming any responsibilities in the Navigation/Operations Department, and shall certify understanding thereof in writing on the master acknowledgement sheet maintained by the Navigator. No individual shall be assigned any navigation responsibilities until so certified. Each new individual assigned to the department will complete the above certification within two weeks of being assigned. If at any time the orders in this manual cannot be complied with, the Navigator shall be notified at once.

5. Changes and Additions. Changes and additions to this manual will be issued when necessary per the procedures contained within this manual. The Department Leading Petty Officer is responsible for entering changes. Any personnel noting necessary changes shall submit them by memorandum to the Navigator via the Assistant Navigator.

Submitted:_____ Approved:_____
Navigator Commanding Officer

Distribution:

CHAPTER I

ADMINISTRATIVE ORGANIZATION

SECTION 1 - DEPARTMENT ORGANIZATION

1100 GENERAL

1. This section lists the functions, duties, responsibilities, and organizational relationships of the Navigator and his assistants. All Navigation/Operations (NAVOPS) Department personnel assigned to the organizational billets listed in the contents sections above shall be governed in the execution of their duties by the paragraphs which follow. Assignment to these billets shall be made by the Navigator, with the exception of the Navigator and the Assistant Navigator who are assigned by the Commanding Officer.

2. All personnel assigned to the NAVOPS Department shall be assigned to billets and stations by the Navigator as coordinated by the Department Leading Petty Officer (LPO) and approved by the Executive Officer. Duties and billets will be assigned for administration, maintenance, and watchstanding. Individual duties may be combined or delegated as directed by the Navigator when the situation dictates.

3. Individual assignments for watches, battle stations, maneuvering watch stations, and other general evolutions will be assigned on the ship’s Watch, Quarter, and Station Bill.

4. **Organization Chart**. The organization of the NAVOPS Department is shown in Figure I-1.

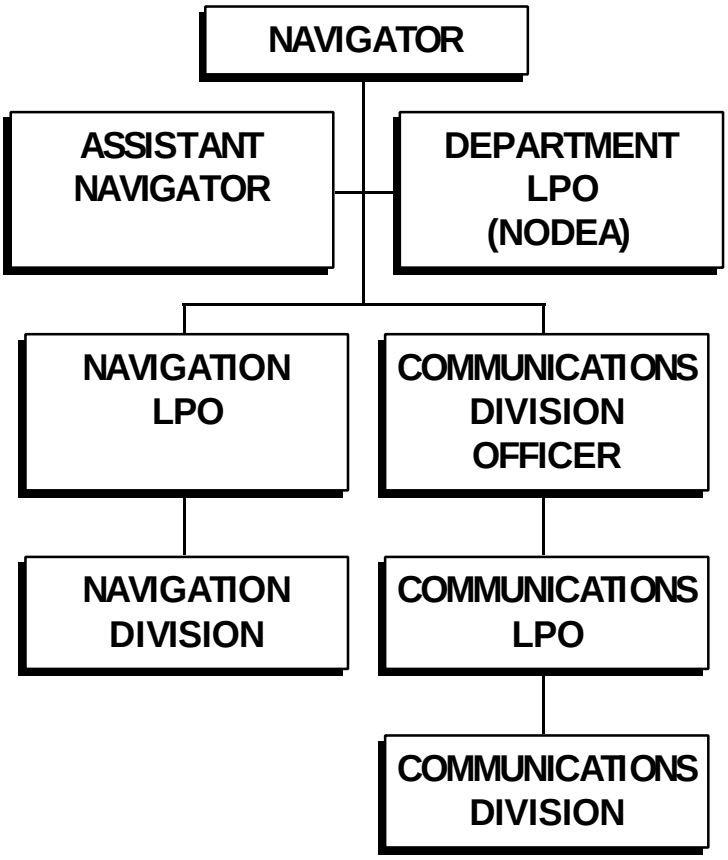

Figure I-1

1101 THE NAVIGATOR

1. **Basic Function**. The Navigator is that officer, designated by the Commanding Officer, who is responsible for the safe navigation and piloting of the ship and is tasked with the direction and supervision of all aspects of the NAVOPS Department. He is the head of the NAVOPS Department and all personnel in the department report to him through the departmental chain of command.

2. **Duties and Responsibilities**. The basic duties and responsibilities of the Navigator are enumerated in references (a) and (b) and include the duties of both the Navigator and the Operations Officer . In addition, he shall:

a. Correct navigational charts and publications as directed by the Commanding Officer (a sample letter of direction is shown on page I-9), prior to any use for navigational purposes. Corrections shall be made per

directions published in Defense Mapping Agency catalog of maps, charts, and related products, PART II, hydrographic products, or the individual document or document change using officially promulgated navigation data. He shall recommend to the Commanding Officer changes to the list necessary to keep it current for ships operations.

b. Personally supervise the navigation of the ship when in restricted waters and when at battle stations, unless specifically assigned to another watch or position on the battle stations team in which case another qualified individual can perform these duties as directed by the Commanding Officer.

c. Determine the ship's intended movements, prepare and complete the Planned Operations and Navigation Checkoff List (Art. 5114) for approval by the Commanding Officer, and prepare a SUBNOTE request if required. (R

d. Prior to anchoring, ensure that all requirements of the Anchoring Bill of reference (c) are completed.

e. Prepare a Navigator's Night Steaming Orders sheet for the Commanding Officer's Night Orders. Samples of such a sheet are provided on pages I-10 and I-11. As a minimum, operating areas, night steaming instructions, aids to navigation, fix interval, and red and yellow soundings will be included. Additional guidance is provided in Article 5108 of this manual. (R

f. Plan and direct the training of the Officers of the Deck in the capabilities, limitations and use of NAVOPS Department electronics equipment, Electronic Support Measures (ESM) systems, communications, navigation, ship's control, and RADAR/IFF equipment.

3. Organizational Relationships

a. The Navigator reports to the Commanding Officer in all matters pertaining to the safe navigation and piloting of the ship, operation and employment of the navigation subsystem, communications systems, ESM, periscope systems, interior communication systems, RADAR/IFF, ship's control systems, and provision of accurate navigation output data for the fire control system. He reports to the Executive Officer in matters pertaining to the administration of the NAVOPS Department.

b. When certified in writing by the Commanding Officer, the Navigator has the authority to relieve the Officer of the Deck while on the bridge or at the conning station when such action is necessary for the safety of the ship while submerged provided no other authorized officer is present.

1102 THE ASSISTANT NAVIGATOR

1. Basic Actions. The Assistant Navigator will assist the Navigator in all aspects of navigating, piloting, and in the administration of navigational charts and publications. He will work closely with the Navigation Division LPO to ensure Navigation Division personnel have an adequate level of knowledge on the status of all navigation equipment that affects the safe navigation of the ship. He will draw on the manpower from the Navigation

Division to accomplish his duties and responsibilities listed below. The Assistant Navigator must be designated in writing by the Commanding Officer and complete qualifications per Chapter IV of this instruction and reference (d).

2. Duties and Responsibilities. The Assistant Navigator shall:

a. Assist the Navigator in all navigation functions.

b. Ensure Navigation Division prepares the following daily at sea:

(1) Time of sunrise, sunset, moonrise, and moonset

(2) Tide/currents

R) (3) 0800 and 2000 position reports for the Navigator's signature

(4) Information for the Commanding Officer's Night Orders

c. Determine the error of each gyro compass daily when weather conditions permit.

d. Ensure Navigation Division procures and maintains all required hydrographic data, navigational charts and'publications and maintains records of corrections for such charts and publications.

e. Frequently review all navigational oriented logs and reports required by this instruction, to ensure completeness, neatness, and accuracy. Bring errors or omissions to the attention of the person concerned and ensure that appropriate and proper corrections are made and that the corrections are reviewed and initialed by the watch officers concerned. Evidence of review by the Assistant Navigator shall be provided by initialing each sheet of the log or record book.

f. Review Navigation Division preparations for getting underway and entering port, and report to the Navigator or Navigation/Operations Department Enlisted Advisor when the division is ready after the Maneuvering Watch has been set.

g. Ensure that all charts used by the Piloting Party, on the bridge and in Sonar contain the Navigator's intended track and all other appropriate required data as instructed by the navigation and piloting bill of reference (c) and the principles of prudent navigation.

h. Ensure the Charts and Publications Petty Officer properly records Notices to Mariners and that corrections are entered to charts and publications prior to use.

1. Ensure that all necessary navigational information is available and up-to-date prior to ship's movements.

j. **Review** the HYDROLANT/HYDROPAC file and the Navigation Hazard Message file and ensure data is entered on charts or in publications when pertinent with respect to present or prospective ship's operations.

k. Review and submit all prepared checklists, voyage plans, and prepared charts and publications to the Navigator for his **review** prior to use for navigation. (A

3. Organizational Relationships

a. The Assistant Navigator reports to the Navigator.

b. The Assistant Navigator **may,** when the Commanding Officer so directs, advise the Officer of the Deck on course, speed, and depth changes .

1103 COMMUNICATIONS DIVISION

1. **Basic** Function. The Communications Division, under the supervision of the Communications Division Officer, is responsible for external communications and for the operation, maintenance, and repair of external communications, periscope, IFF and ESM equipment. The Communications Division must also maintain the proficiency of electronic search operators for the operation and maintenance of such other electronic equipment as assigned.

1104 THE NAVIGATION DIVISION

1. **Basic Function.** The Navigation Division, under the supervision of the Navigation Division Leading Petty Officer, is responsible for navigational, radar, interior communications and other electronic equipment as assigned. The Navigation Division Leading Petty Officer will provide manpower to the Assistant Navigator as necessary to assist the ANAV in the performance of his duties. (R

1105 THE DEPARTMENT LEADING PETTY OFFICER (LPO)

1. **Basic Function.** Normally, the senior enlisted man assigned to the NAVOPS Department will be assigned duties as the NAVOPS Department LPO (Navigation Operations Department Enlisted Advisor - NODEA). This individual will assist the Navigator in coordinating department wide enlisted matters within the NAVOPS Department and in the handling of certain administrative items.

2. **Duties and Responsibilities.** The duties of the NODEA include the following:

a. Administering the NAVOPS Department training and qualification program. This is to include advising the Navigator of the state of training and watch standing performance of department personnel.

b. Preparing and maintaining appropriate watches on the Watch, Quarter, and Station Bill for approval by the Navigator and submission to the Chief of the Boat and/or the Executive Officer.

c. Directing and supervising of the cleaning and preservation of areas assigned to the NAVOPS Department.

d. SSBN procedures necessary to effect rapid and complete turnover of department material during Exchange of Command.

e. Supervising NAVOPS Department preparations for getting underway and entering port, and reporting to the Navigator when the department is ready after the Maneuvering Watch has been set.

f. Supervising the administration of the NAVOPS Department 3-M program.

g. Assisting the Navigator in administering enlisted personnel.

h. Assigning enlisted personnel to special short-term details.

i. Performing liaison for the NAVOPS Department at the Chief Petty Officer level with other departments.

3. **Organization Relationship**. The NAVOPS Department LPO reports directly to the Navigator.

1106 THE DEPARTMENT 3M COORDINATOR

1. **Basic Function**. The Department 3M Coordinator directly assists the Navigator in the administration and implementation of the ship's Maintenance and Material Management (3M) system. Normally, the Department LPO will be assigned the duties of Department 3M Coordinator.

2. **Duties and Responsibilities**. Duties and responsibilities of the Department 3M Coordinator are per reference (e) and TYCOM and local directives.

3. **Organizational Relationships**.

a. The Department 3M Coordinator reports to the Navigator, via Department LPO if applicable, in matters pertaining to the 3M system.

b. The Department 3M Coordinator shall work in close concert with the ship's 3M Coordinator to ensure proper departmental implementation of the 3M system.

1107 ELECTRONICS MATERIAL OFFICER (EMO)

1. **Basic Function**. The EMO is responsible for the performance of IFF, ESM equipment, periscope equipment, the proficiency of electronic search operators, and for the operation and maintenance of such other electronic equipment as may be assigned. This position is normally filled by the Communications Division LPO or the ESM Work Center Supervisor.

2. **Duties and responsibilities**. The duties of the EMO are delineated in reference (a) Article 324.2. In addition, the EMO shall be responsible for:

a. The training of department personnel; ESM operators and RADAR/IFF watchstanders.

b. The maintenance and repair of all ESM and test equipment.

c. Assisting, when requested, in the repair and maintenance of electronic equipment assigned to other divisions.

d. Keeping himself informed on the status of the ship's electronic equipment allowance and ensuring that authorized equipment is requisitioned and procured. When necessary, supervising the installation of such equipment, subject to approval of the Navigator.

e. Advising the Supply Officer to ensure the proper requisitioning of electronic spare parts per appropriate allowance lists.

f. Ensuring that the ship's electronic configuration is accurately documented.

g. Maintaining current files of Electronic Information Bulletins and Electronic Information Maintenance Bulletins and routing new issues for review by the Commanding Officer, Navigator, Sonar Officer, Engineer, Reactor Controls Assistant, Electrical Officer, Combat Systems Officer(SSN), Tactical Systems Officer/Strategic Weapons Officer (Trident), and Communicator.

3. **Organizational Relationship**. The EMO reports to the Communications Division LPO or Communications Officer as appropriate.

1108 INTELLIGENCE OFFICER

1. **Basic Function**. The Intelligence Officer, under the Navigator, is responsible to the Commanding Officer for collection, evaluation, and dissemination of intelligence information.

2. **Duties and Responsibilities**. General duties of the Intelligence Officer are defined in reference (a) Article 324.4. Specifically, he will:

a. Maintain custody of a current library of required intelligence publications per the TYCOM instruction 5601 and periodic TYCOM notices (CSL-5605/CSP-5215). The Sonar Officer shall be custodian of acoustic intelligence material. However, the Intelligence Officer will keep himself informed of the status of onboard acoustic intelligence material and, in cases where an item of intelligence material contains acoustic as well as other types of intelligence, the item will be in the custody of the Intelligence Officer.

b. Supervise ship's force intelligence collection.

c. Disseminate intelligence information as required for training and ship's operations.

3. **Organizational Relationships**. The Intelligence Officer reports to the Navigator. All personnel regardless of departmental assignment involved in collection of intelligence will report to the Intelligence Officer on matters of intelligence. The Sonar Officer will report acoustic intelligence information to the Intelligence Officer.

1109 PHOTOGRAPHIC OFFICER

1. **Basic Function**. The Photographic Officer, under the direction of the Navigator, is responsible to the Commanding Officer for the conduct of photography and maintenance of photographic equipment.

2. **Duties and Responsibilities**. General duties of the Photographic Officer are defined in reference (a) Article 305.18. Specifically, he will:

a. Develop and maintain a continuing capability of taking, developing and printing pictures on short notice or as required. In particular, train and equip officers of the deck using targets of opportunity to conduct periscope photography and to obtain all other forms of periscope imagery for which the ship is capable.

b. Be assisted by such personnel as may be designated by the Executive Officer. Such personnel need not be members of the NAVOPS Department.

c. Organize and train the photographic party. Plan and execute all photographic missions per NWP 3-54.4 and NWP 3-55.42.

d. Act as custodian of ship's photographic equipment and ensure that equipment and consumables are used for official purposes. Coordinate with the Supply Officer in the administration of the ship's photographic budget allowance.

e. Endeavor to develop the capabilities of amateur photographers onboard for employment as required.

3. **Organizational Relationships**. Photographic Officer reports to the Intelligence Officer on items of intelligence interest, to the Public Affairs Officer on public affairs photography, and to the Executive Officer for damage and casualty photography. Personnel as designated by the Executive Officer report to the Photographic Officer.

1110 DEPARTMENT SPECIAL ASSISTANTS

1. In addition to the Department 3M Coordinator, other departmental assistants such as Training Petty Officer, Qualification Petty Officer, and a Department Career Counselor may be assigned. These assistants will assist the LPO of the department in carrying out his duties with respect to a particular administrative area, and will report directly to the Department LPO with regard to these duties.

USS_____NAVOPSDEPTINST 5400.___

SAMPLE CHARTS AND PUBLICATIONS CORRECTIONS LETTER

From: Commanding Officer, USS _____
To: Navigator, USS _____

Subj: CORRECTIONS TO NAVIGATIONAL CHARTS AND PUBLICATIONS

1. The following charts and publications shall be maintained up-to-date by correcting them to the latest Notice to Mariners held onboard within four working days:

2. Those charts not listed in paragraph 1 above, but known to be needed for operations shall be corrected through the latest Notice to Mariners before the scheduled date of operations.

3. All navigational charts or publications shall be corrected up-to-date prior to any use for navigational purposes.

4. A complete record of all applicable changes to navigational charts and publications shall be maintained up-to-date and a file of unentered changes maintained in such a manner as to facilitate entering changes to charts not being kept up-to-date.

/S/ _____

USS_____NAVOPSDEPTINST 5400.___

"CLASSIFICATION AS APPROPRIATE"

SAMPLE INFORMATION FOR COMMANDING OFFICER'S NIGHT ORDERS (SSBN)

Underway in accordance with _____

Area _____ Next Area _____ ETA _____

Chart in Use _____ Next Chart _____ ETC _____

Red Sounding _____ Yellow Sounding_____ Minimum Expected Sounding_____

Approach _____ No Closer Than _____

Remain Within _____ Miles of PIM/Track

Maintain continuous communications. Obtain Loran "C" positions.

Operations/Night Steaming Orders:_____

_____

_____

OPAREAS Assigned:_____

Mutual Interference:_____

Navigation Aids Expected: (Name, Characteristics)_____

Times When GPS is Unavailable_____

Track Passes_____

TACAMO_____

Engineering Evolutions_____

Weapons Evolutions_____

Special Notes:_____

Sunset _____ Sunrise _____ Moonrise _____ Moonset _____

****SAMPLE (Tailor to your own ship's desires) SAMPLE****

"CLASSIFICATION AS APPROPRIATE"

SAMPLE NAVIGATOR'S NIGHT STEAMING ORDERS SHEET (SSN)

Date:

From: Navigator
To: Commanding Officer

Subj: NAVIGATOR'S NIGHT STEAMING ORDERS

1. Underway in accordance with_____

2. OPAREAs Assigned:_____

   Night Steaming Orders:_____

_____

_____

_____

3. Navigation aids expected:

NAME:	CHARACTERISTICS:
_____	_____
_____	_____
_____	_____

4. Red/Yellow Soundings/Time: _____

5. Charts in use: _____

6. Acceptable distances from the intended track (MHN considered): _____

7. Remarks:_____

_____

_____

8. SUNSET _____ SUNRISE _____ MOONRISE _____ MOONSET _____

****SAMPLE **SAMPLE **SAMPLE**

(Tailor to ship's desires)

USS_____NAVOPSDEPTINST 5400.___

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CHAPTER I

ADMINISTRATIVE ORGANIZATION

SECTION 2- NAVIGATION DIVISION ORGANIZATION

1200 NAVIGATION DIVISION

1. **Organization Chart**. The organization of the Navigation Division is shown below:

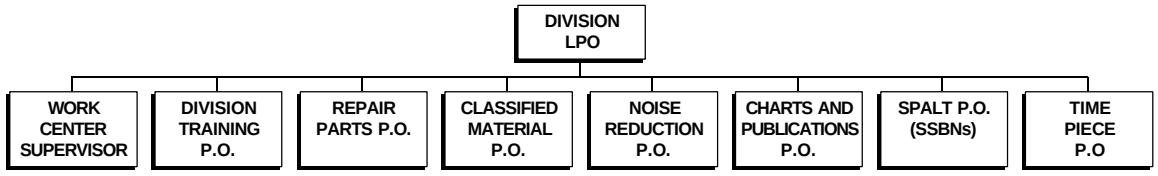

Figure I-2

1201 THE NAVIGATION DIVISION LEADING PETTY OFFICER (LPO)

1. **Basic Function**. The Navigation Division LPO is responsible for the procurement and maintenance of all hydrographical data, charts, and publications, the proper administration, qualification, and training of personnel, and the administration and material upkeep of the equipment assigned to the Navigation Division. He also provides personnel and divisional support for the Assistant Navigator's responsibilities. Normally the senior Navigation Division ET is assigned the duties of LPO.

2. **Duties and Responsibilities**. The Division LPO shall:

a. Instruct and supervise personnel of the division in their assignments and duties. He shall keep informed of the capabilities and need of each individual and take such action as may be necessary for the efficiency of the division, and the welfare and morale of personnel assigned.

b. Schedule and conduct training for personnel assigned to the division including indoctrination of new personnel, preparation for advancement in rating, team training, watch station training, and instruction in the principles of effective leadership. He shall ensure that the required records are maintained to effectively manage the training program. He shall work closely with the ANAV to maintain adequate Navigation level of knowledge.

c. Ensure that prescribed security measures are strictly observed by personnel of the division.

d. Instruct all division personnel in applicable safety precautions and require strict observance of safety regulations.

e. Review Navigation Division preparations for getting underway and entering port, and report to the Navigator and ANAV when the division is ready to do so after the Maneuvering Watch has been set.

f. Submit recommended assignments for the Watch, Quarter, and Station Bill and such other bills as may be necessary, to the Assistant Navigator and Department LPO. Recommendations shall be based on providing a rotational plan for battle stations, general watches and duties that will ensure the training and proficiency of assigned personnel.

g. Act as subcustodian for division equipment and equipage.

h. Ensure that all equipment assigned to the division is maintained, calibrated, adjusted, and operational. Initiate action to correct deficiencies.

i. Instruct and supervise divisional watchstanders in the performance of their duties.

j. Maintain the division's section of the Equipment Status Log (ESL) current.

k. Maintain and submit proper division records and reports.

1. Supervise and frequently inspect division performance to ensure that sound electronics, engineering and seamanship practices, authorized operating and maintenance procedures, and safety precautions are used at all times.

m. Review division logs and records frequently to ensure that they comply with applicable directives.

n. Properly plan work, including preventive maintenance, to be accomplished by the division.

o. Maintain appropriate portions of the NAVOPS Department checkoff load lists for consumable materials, flags, and other material as directed by the Division Officer.

p. Ensure that the Navigation Division is properly trained and capable of obtaining all possible fixes of opportunity (i.e., each time the ship comes to periscope depth).

q. Ensure the Charts and Publications Petty Officer procures and properly maintains all required hydrographical data, navigational charts and publications, and maintains records of corrections for such charts and publications.

r. Designate trained personnel to prepare all checklist, voyage plans, and charts/publications required for piloting, open ocean navigation, and voyage planning. Additionally, provide assistance personnel to the Assistant Navigator as required by ships operations to ensure proper administration, preparation, training, and execution of items involving the safe navigation of the ship.

(D

3. **Organizational Relationships**. The Navigation LPO reports to the Assistant Navigator and the Navigator on all items affecting the safe navigation of the ship. He reports to the Navigator on all other matters pertaining to the division.

1202 WORK CENTER SUPERVISOR

1. **Basic Function**. The Work Center Supervisor is that petty officer, normally a senior petty officer who has completed the appropriate maintenance course for the subsystem, assigned by the Division Officer with responsibilities as prescribed by Volume I of the ship's 3M Manual, Article 366 of reference (a), reference (e) and as delineated herein. He shall be formally trained in the 3M system (J-500-0025).

2. **Duties and Responsibilities**. The Work Center Supervisor will:

a. Schedule weekly work center maintenance, and supervise its proper accomplishment.

b. Ensure that the status of work center planned maintenance is correctly reflected on PMS schedules.

c. Ensure that his Division LPO is advised of all maintenance activity within his work center.

d. Ensure that all maintenance documentation from his work center is correct and promptly submitted.

e. Ensure maximum use of PMS as an aid in training personnel in maintenance procedures for equipment within the work center.

f. Maintain control and accountability of JSNs within the work center.

g. Verify that the CSMP is current.

h. Review MRCs and report errors by PMS feedback form, keeping the division LPO advised of action taken.

i. Maintain an accurate and current LOEP for the division 3M books by comparing the documentation with the actual equipment configuration in the work center.

j. Train subordinates in PMS and MDCS procedures as required.

3. **Organizational Relationships**. The Work Center Supervisor reports to the division LPO.

1203 THE REPAIR PARTS PETTY OFFICER

1. **Basic Function**. The Repair Parts Petty Officer is that member of the division, designated by the Division Officer, who is charged with the proper conduct of supply matters within his division.

2. **Duties and Responsibilities**. In order to ensure that the division is supported by the proper type and number of consumables and repair parts, the Repair Parts Petty Officer shall:

a. Coordinate with the Supply Department to ensure prompt ordering of supplies needed for the continued and proper operation of all division equipment.

b. Maintain the inventories and records required for accountability and usage data as specified by the Supply Officer.

3. **Organizational Relationship**

a. The Repair Parts Petty Officer reports to the Division LPO for the proper and complete procurement and stowage of all necessary consumables and repair parts required.

b. The Repair Parts Petty Officer reports to the Leading Storekeeper for the technical performance of ordering and procuring items per Supply Department instructions.

1204 DIVISION TRAINING PETTY OFFICER

1. **Basic Function**. The Division Training Petty Officer assists the Division Officer and Division LPO in planning and administering the divisional training program.

2. **Duties and Responsibilities**. The Division Training Petty Officer will assist the Division Officer in carrying out the duties enumerated in Chapter IV and shall maintain current all training records required by Chapter VII of the Joint Training Manual.

3. **Organizational Relationship**. The Division Training Petty Officer reports to the Division LPO in matters pertaining to divisional training.

1205 THE CLASSIFIED MATERIAL PETTY OFFICER

1. **Basic Function**. The Classified Material Petty Officer is responsible for the proper storage, inventory, and distribution of all classified material, except classified installed equipment, assigned to the division.

2. **Duties and Responsibilities**. The Classified Material Petty Officer shall:

a. Maintain records of classified material per reference (f) for all classified material (except classified installed equipment) assigned to the division.

b. Conduct required inventories of all classified material (except classified installed equipment) per reference (f) and applicable local directives.

c. Maintain the Classified Material Check-out Log and ensure that the persons receiving the material have proper clearances and "Need to Know."

3. **Organizational Relationship**. The Classified Material Petty Officer reports to the Division LPO.

1206 CHARTS AND PUBLICATIONS PETTY OFFICER

1. **Basic Function**. The Charts and Publications Petty Officer is that member of Navigation Division designated to maintain a complete, current, and correct allowance of charts and publications. This Petty Officer works directly for the ANAV.

2. **Duties and Responsibilities**. The Charts and Publications Petty Officer shall:

a. Ensure that publications and charts as listed in references (g) and (h) are onboard and current. (The Commanding Officer will designate in writing those charts to be corrected on a routine basis).

b. Maintain complete file of chart correction cards for the full chart and publication allowance per instructions contained in reference (g) and Art. 6107 and 6112 of this Notice. Notices to Mariners will be properly recorded on correction cards within three working days of receipt.

c. Conduct a complete audit and inventory of navigational charts and publications when directed. A report of inventory with discrepancies will be made in writing to the Navigator via the Assistant Navigator.

d. Administer the watch-to-watch inventory of those classified charts and publications on sub-custody to the Navigation Department and held by the Quartermaster of the Watch. Handling of classified material will be per the Official Correspondence Bill of reference (b).

e. Ensure that the necessary communications, signaling, and recognition publications are available to the Quartermaster of the Watch if these publications are on subcustody to the Navigator.

3. **Organizational Relationships**. The Charts and Publications Petty Officer reports to the Navigation Division LPO.

1207 SPALT PETTY OFFICER (SSBNs)

1. **Basic Function**. The SPALT Petty Officer is responsible under the Navigation Division LPO for the administration of the Strategic Systems Project Alteration (SPALT) Program as applicable to the Strategic Navigation Subsystem.

2. **Duties and Responsibilities**. The SPALT Petty Officer shall:

a. Review the SPALT Planning and Authorization Report (SPAR) and determine which SPALTs are authorized to be accomplished.

b. Ensure that all SPALTs are accomplished per reference (i) and applicable SSP procedures and directives. Initiate and maintain records and reports as required by reference (j) and applicable SSP procedures and directives.

c. Maintain records pertaining to applicable SPALTS. Initiate action as required for timely accomplishment of such alterations, improvements and changes.

3. **Organizational Relationship**. The SPALT Petty Officer reports to the Division LPO.

1208 NOISE REDUCTION PETTY OFFICER

1. **Basic Function**. The Noise Reduction Petty Officer shall ensure all division personnel take an aggressive approach to and promote the Noise Reduction Program, record and track all division noise deficiencies in the noise reduction section of the ESL, and report deficiencies to the LPO.

2. **Duties and Responsibilities**. Specific responsibilities of the Noise Reduction Petty Officer are detailed in reference (j) Volume IV, Appendix 2A.

3. **Organizational Relationships**. The Noise Reduction Petty Officer reports to the Division LPO.

1209 TIMEPIECE PETTY OFFICER

1. **Basic Function**. The Timepiece Petty Officer assists the Division LPO in the proper care, stowage and repair to the ship's timepieces and meteorological instruments.

2. **Duties and Responsibilities**

a. The Timepiece Petty Officer is responsible for determining the performance of ship's clocks and watches. He will initiate action to effect repair or replacement of any clock, watch or meteorological instrument as required.

b. He will wind, if applicable, and set all ship's clocks at least every four days. The digital clock or frequency time standard will normally be used as the reference for setting the ship's clocks unless directed otherwise by the Navigator. When underway the Timepiece Petty Officer will compare the following clocks daily prior to 1100 (local): the Control Room/Attack Center clocks, Missile Control Center clocks (SSBN), Commanding Officer's Stateroom clock, OPCON Center (SSBN), Sonar clock, Radio Room clock and Maneuvering Room clock. He will ensure that these clocks are wound and compared one hour prior to setting the Maneuvering Watch. He will report that this has been accomplished to the Division LPO, and cause this fact to be logged in the Ship's Deck Log.

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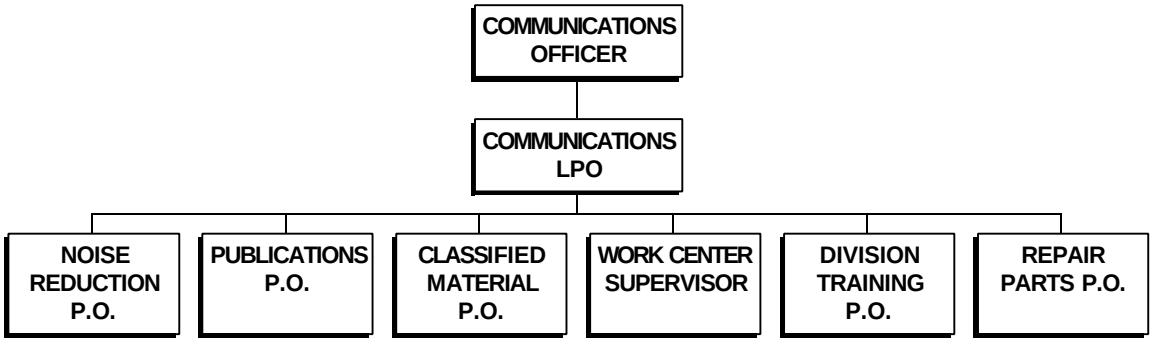
CHAPTER I

ADMINISTRATIVE ORGANIZATION

SECTION 3 - COMMUNICATIONS DIVISION ORGANIZATION

1300 COMMUNICATIONS DIVISION

1. **Organization Chart**. The organization of the Communications Division is shown below:



1301 COMMUNICATIONS OFFICER

1. **Basic Function**. The duties of the Communications Officer are delineated in Article 1103 of this manual and in references (a) and (b).

2. **Duties and Responsibilities**. The basic function, duties, responsibilities and authority are defined in reference (a) Article 361. Additionally, the Communications Division Officer is also responsible for external

communications and for the operation, maintenance, and repair of external communications, IFF, and ESM equipment.

3. **Organizational Relationships**. The Communications Division Officer reports to the Navigator regarding all operational and administrative matters pertaining to the Communications Division.

1302 COMMUNICATIONS DIVISION LEADING PETTY OFFICER (LPO)

1. **Basic Function**. The Communications Division LPO is responsible for the proper administration, qualification, and training of division personnel, and for the administration and material upkeep of the equipment assigned to the division. Normally the senior Communications Division ET is assigned the duties of LPO.

2. **Duties and Responsibilities**. The Communications Division LPO shall:

a. Instruct and supervise personnel of the division in their assignments and duties. He shall keep informed of the capabilities and need of each individual and take such action as may be necessary for the efficiency of the division, and the welfare and morale of personnel assigned.

b. Schedule and conduct training for personnel assigned to the division including indoctrination of new personnel, preparation for advancement in rating, team training, watch station training, and instruction in the principles of effective leadership. He shall ensure that the required records are maintained to effectively manage the training program.

c. Ensure that prescribed security measures are strictly observed by division personnel.

d. Instruct all division personnel in applicable safety precautions and require strict observance of safety regulations.

e. Submit recommended assignments for the Watch, Quarter, and Station Bill and such other bills as may be necessary, to the Department LCPO. Recommendations shall be based on providing a rotational plan for battle stations, general watches and duties that will ensure the training and proficiency of assigned personnel.

f. Act as subcustodian for division equipment and equipage.

g. Ensure that all equipment assigned to the division is maintained, calibrated, adjusted, and operational. Initiate action to correct deficiencies.

h. Instruct and supervise divisional watchstanders in the performance of their duties.

i. Maintain the division's section of the Equipment Status Log (ESL) current.

j. Maintain and submit proper division records and reports.

k. Supervise and frequently inspect division performance to ensure that good electronics, engineering and seamanship practices, authorized operating and maintenance procedures, and safety precautions are used at all times.

1. Periodically review division logs and records to ensure that they comply with applicable directives.

m. Properly plan work, including preventive maintenance, to be accomplished by the division.

n. Maintain appropriate portions of the NAVOPS Department checkoff load lists for consumable and other material as directed by the Communications Officer.

o. Be thoroughly familiar with and ensure compliance with the following:

(1) NTP 3 (Telecommunications Users Manual).

(2) NTP 4 (U.S. Naval Telecommunications Procedures - Fleet Communications).

(3) COMSUBPACINST C2000.1 (SUBPAC CEI) (SUBPAC SHIPS).

(4) Annex K to COMSUBLANT OPORD 2000 (SUBLANT SHIPS).

(5) Annex K to CINCPACFLT OPORD 201/CINCLANTFLT OPORD 2000.

(6) NWP 3-13.10.1, 3-55.411, 3-55.412, 3-13.10,1 (Vol 1,3,4,6), 77-05(A), 77-05-01.

p. The cleanliness and appearance of all assigned spaces.

q. In addition to his duties as the Communications Division LPO, he shall serve as a member of the crypto board, if required.

3. **Organizational Relationship**. The Communications Division LPO reports to the Communications Officer.

1303 WORK CENTER SUPERVISOR

1. **Basic Function**. The Work Center Supervisor is that petty officer, normally a senior petty officer who has completed the appropriate maintenance course for the subsystem, assigned by the Division Officer with responsibilities as prescribed by Volume I of the ship's 3M Manual, Article

366 of reference (a), reference (e), and delineated herein. He shall be formally trained in the 3M system.

2. **Duties and Responsibilities**. The Work Center Supervisor will:

a. Schedule weekly work center maintenance, and supervise its proper accomplishment.

b. Ensure that the status of work center planned maintenance is correctly reflected on PMS schedules.

c. Ensure that his Division LPO is advised of all maintenance activity within his work center.

d. Ensure that all maintenance documentation from his work center is correct and promptly submitted.

e. Ensure maximum use of PMS as an aid in training personnel in maintenance procedures for equipment within the work center.

f. Maintain control and accountability of job sequence numbers (JSNS) within the work center.

g. Verify that the CSMP is current.

h. Review MRCs and report errors by PMS feedback form, keeping the division LPO advised of action taken.

i. Maintain an accurate and current LOEP for the division 3M books by comparing the documentation with the actual equipment configuration in the work center.

j. Train subordinates in PMS and MDCS procedures as required.

3. **Organizational Relationships**. The Work Center Supervisor reports to the division LPO.

1304 ELECTRONICS WARFARE OFFICER (EWO)

1. **Basic Function**. The Electronics Warfare Officer is responsible for the duties and responsibilities defined in reference (a) Article 324.3. This position is normally filled by the ESM Work Center Supervisor.

2. **Organizational Relationships**. The EWO reports to the Communications Division LPO.

1305 REPAIR PARTS PETTY OFFICER

1. **Basic Function**. The Repair Parts Petty Officer is that member of the division, designated by the Communications Officer, who is charged with the proper conduct of supply matters within his division.

2. **Duties and Responsibilities**. In order to ensure that the division is supported by the proper type and number of consumables and repair parts, the Repair Parts Petty Officer shall:

a. Coordinate with the Supply Department to ensure prompt ordering of supplies needed for the continued and proper operation of all division equipment.

b. Maintain the inventories and records required for accountability and usage data as specified by the Supply Officer.

3. **Organizational Relationship**

a. The Repair Parts Petty Officer reports to the Division LPO for the proper and complete procurement and stowage of all necessary consumables and repair parts required.

b. The Repair Parts Petty Officer reports to the Leading Storekeeper for the technical performance of ordering and procuring items per the Supply Department instructions.

1306 DIVISION TRAINING PETTY OFFICER

1. **Basic Function**. The Division Training Petty Officer assists the Communications Officer and Division LPO in planning and administering the divisional training program.

2. **Duties and Responsibilities**. The Division Training Petty Officer will assist the Communications Officer in carrying out the duties enumerated in Chapter IV and shall maintain current all training records required by Chapter VI and reference (d).

3. **Organizational Relationship**. The Division Training Petty Officer reports to the Division LPO in matters pertaining to divisional training.

1307 CLASSIFIED MATERIAL PETTY OFFICER

1. **Basic Function**. The Classified Material Petty Officer is responsible for the proper storage, inventory, and distribution of all classified material, except classified installed equipment, assigned to the division.

2. **Duties and Responsibilities**. The Classified Material Petty Officer shall:

a. Maintain records of classified material per reference (f) for all classified material (except classified installed equipment) assigned to the division.

b. Conduct required inventories of all classified material (except classified installed equipment) per reference (f) and applicable local directives.

c. Maintain the Classified Material Check-out Log and ensure that the persons receiving the material have proper clearances and "need to know."

3. **Organizational Relationship**. The Classified Material Petty Officer reports to the Division LPO.

1308 PUBLICATIONS PETTY OFFICER

1. **Basic Function**. The Publications Petty Officer is responsible, under the Division LPO for maintenance of operational and technical publications assigned to the division.

2. **Duties and Responsibilities**. The Publications Petty Officer shall:

a. Enter and document changes to publications held by Communications Division upon receipt onboard.

b. Maintain files of records and reports concerning Communications equipment performance. As a minimum these should include system nominal performance data sheets, readiness and training memoranda (TYCOM/Group/Squadron) applicable to Communications Division, equipment maintenance bulletins, etc. These documents should be retained on file for a minimum of three years unless specifically directed otherwise.

c. Prior to return from deployment, inventory publications and audit applicable records. Correct all deficiencies noted.

3. **Organizational Relationship**. The Publications Petty Officer reports to the Division LPO.

1309 NOISE REDUCTION PETTY OFFICER

1. **Basic Function**. The Noise Reduction Petty Officer shall ensure all division personnel take an aggressive approach to and promote the Noise Reduction Program, record and track all division noise deficiencies in the noise reduction section of the ESL, and report deficiencies to the LPO.

2. **Duties and Responsibilities**. Specific responsibilities of the Noise Reduction Petty Officer are detailed in reference (j) Volume IV, Appendix 2A.

3. **Organizational Relationships**. The Noise Reduction Petty Officer reports to the Division LPO.

CHAPTER II

WATCH ORGANIZATION

SECTION 1 - UNDERWAY WATCHES

2100 GENERAL

1. Underway watches in the NAVOPS Department shall be assigned per the Ship's Watch, Quarter, and Station Bill (WQSB).

2. Before standing a watch, a man must be certified in writing by the Navigator (QMOW, Radio Supervisor - SSBN, and NAVCTR Supervisor - SSBN are certified by the Commanding Officer) as having satisfactorily completed the qualification requirements for the watch station involved. Qualification requirements for each watch station are promulgated in Chapter IV. An unqualified watchstander may stand an under instruction watch under the direct supervision of a qualified watchstander, who retains full responsibility for the proper conduct of the watch.

3. Procedures to be followed by each watchstander in the execution of his duties are found in reference (c).

4. When NAVOPS Department personnel are assigned to a watch under the cognizance of another department, they shall be governed in their watch standing duties by the procedures and organizational relationships delineated by that department.

5. Proposed WQSB and changes to the WQSB will be reviewed by the Navigator and Department LPO, who will ensure that only properly qualified personnel are assigned to each watch station under cognizance of the NAVOPS Department.

2101 NAVIGATION SUPERVISOR

1. **Basic Function**. The Navigation Supervisor will be stationed at times recommended by the Navigator and approved by the CO when an increased supervision of the navigation picture is necessary but stationing of the full piloting party would be imprudent. An example would be extended submerged operation in shallow water. When stationed, the Navigation Supervisor is responsible for closely supervising the performance of the QMOW and all navigation equipment. He reports to the Officer of the Deck.

2. **Duties and responsibilities**

a. Stand his watch in Control, primarily in the vicinity of the Navigation Plot.

b. Monitor the performance of the QMOW, the Fathometer Watch and the Navigation Watch.

c. Periodically review navigational logs and records required by this instruction to ensure completeness, neatness and accuracy.

A)

d. Verify plotted boundaries or track are in accordance with current operations. Inform the OOD of any discrepancies.

e. Receive routine reports from the QMOW which would normally be reported to the Navigator. Immediately inform the Navigator of any position uncertainty that could place the ship in a hazardous condition or any navigational equipment degradation.

f. Evaluate each plotted fix and assign quality. Continuously evaluate the proximity to navigational hazards and make appropriate recommendations to the OOD.

3. **The Navigation Supervisor shall meet the following requirements:**

a. Be a submarine qualified officer, or an enlisted man qualified as Assistant Navigator.

b. Specifically designated in writing by the CO to stand watch as Navigation Supervisor.

2102 QUARTERMASTER OF THE WATCH (QMOW)

1. **Basic Function**

a. The safe navigation of the ship is the QMOW's primary responsibility. The QMOW is the direct representative of the Navigator for the watch section. He will assist the Navigator and Officer of the Deck (OOD) in plotting the ship's position and will immediately inform the Navigator, OOD, and Assistant Navigator when there is a significant variance from the intended track. This shall not be construed to limit the QMOW in the exercise of his best

professional judgment in assessing small discrepancies and advising the-personnel cited above. Guidance in acceptable distances from the intended track will be provided in the Commanding Officer's Night Orders/Standing Orders.

b. The QMOW represents a continuous navigational watch **in** the Attack Center/Control Room. (The QMOW may go to the bridge to explain the Navigational picture to the OOD.) He is the primary assistant to the OOD for navigation, visual communications and recording of all events affecting the ship and all personnel attached to or embarked in the ship.

2. **Duties, Responsibilities and Authority**

a. The QMOW is responsible to the OOD for keeping track of the ship's position and for giving prompt notice to the OOD and Navigator of all of the items listed below (and for making routine reports listed in Chapter V):

(1) If the ship's position does not conform to the intended track (Exceptions may be made in specific instances by the Commanding Officer or Navigator, in which case the allowed variance from the intended track will **be** specified.)

(2) Changes in weather or visibility which might adversely affect the safe navigation of the ship, the ability to sight land, and navigation aids when such events are planned

(3) All changes in course, speed, and depth except when clearing baffles or specifically excepted by the Commanding Officer

(4) Any unexpected changes in soundings or when the YELLOW or RED soundings (as approved by the Commanding Officer) are reached

(5) Sightings of navigational importance

(6) The loss or derangement of any navigation equipment

(7) Any sighting not made at the expected time or bearing

b. The QMOW, if in doubt or uncertain about the'ship's position or safety shall immediately notify the OOD, Navigator, and Assistant Navigator in that order.

c. Prior to relieving the watch, the QMOW shall:

(1) Ascertain the ship's position by visual or electronic means if possible, and check the accuracy of the ship's Dead Reckoned (DR) position, SINS/DMINS/ESGN(M)/RLGN EPs and track. (R

(2) Review the intended track for the period of the watch plus two hours and determine the uncertainty in ship's position based on fix expansion, checking for navigation aids, depth of water, and hazards to navigation.

(3) Ensure all necessary charts and publications are available in the Attack Center.

(4) Ensure the Ship's Deck Log and/or SSBN patrol operations log is up-to-date and accurate.

(5) Read and initial the Commanding Officer's Night Orders.

(6) Sight the accountable charts, publications, and communications log.

(7) Ascertain the ship's course, speed, and depth, and the status of all unexecuted orders.

(8) Check the operating condition of all navigation equipment, ship control equipment, visual signaling, and underwater communications equipment.

(9) Know the whereabouts of the Commanding Officer, Navigator, and Assistant Navigator.

(10) Ensure that the previous watch's logs are proper, completed and signed.

(11) Ensure that the DRT is prepared.for man overboard recovery when operating on the surface.

(12) Be aware of the identity of all call signs and voice calls with which operations are being conducted.

(13) Know the time and planned means of the next fix.

(14) Verify that the ship is in its assigned Operating Area, Patrol Area or Moving Haven using the message or document assigning the area.

d. Prior to relieving the watch, the QMOW will plot the position of the ship using all information available.

e. During the watch, the QMOW is responsible for the specific items listed below. Whenever these requirements cannot be met, the off-watch QMOW, Assistant Navigator and Navigator shall be called to assist in navigation of the ship. The SAFE NAVIGATION of the ship is the **QMOW's** PRIMARY RESPONSIBILITY.

(1) Carrying out the watch routine

(2) Keeping required logs and records.

(3) Assisting the OOD, Navigator, and Assistant Navigator in piloting the ship.

(4) Resetting the DRT with the Navigator's approval.

(5) Operating the fathometer with permission of the OOD. With such permission, soundings will be taken and recorded in the Fathometer Log, Ship Position Log, or Bearing Record Book, as applicable, when any fix is obtained and at least every 30 minutes, unless otherwise directed. Soundings will also be taken prior to diving and prior to increasing depth as directed by the OOD.

(6) Being alert to prevent any change in the status of equipment supplying inputs to the SINS/DMINS/ESGN(M)/RLGN, DRT and steering repeater, such as the log, dummy log, or compass. He will immediately inform the OOD and Navigator of any change in the status of such equipment and will log the time and nature of such occurrence in the Ship Position Log, noting DDRT and SINS/DMINS/ESGN(M)/RLGN readings at the time. (R

(7) Making reports to the Navigator and Assistant Navigator.

(8) Being careful to double check all position plotting calculations and procedures.

(9) Maintaining the cleanliness of assigned spaces.

(10) Monitoring the Helmsman for ordered ship's course and speed.

(11) Taking an azimuth of the sun or Polaris daily when operations and weather permit, recording and reporting results to the OOD and the Navigator.

(12) Ensuring that readings of the master SINS/DMINS/ESGN/RLGN and steering repeaters are compared every hour. Log the completion of this comparison in the Ship's Deck Log. Ensure a simultaneous comparison of all installed heading sources and heading repeaters are made and recorded once each watch. Make a deck log entry and notify the Navigator and Officer of the Deck if the SINS/DMINS/ESGN/RLGN, MK 19/WSN-2 and steering repeater heading differences are greater than 1.0 degree (2.0 degrees for MK 27 gyro). (R

(13) Monitoring SINS/DMINS/ESGN/RLGN performance and maintaining the SINS/DMINS/ESGN Position Error Chart in the absence of the Navigation Watch (SSN). (R

(14) Assisting the OOD in the conduct of visual and underwater communications, maintaining appropriate logs of all transmissions.

(15) Comparing the control, MCC (by phone) (SSBN), and maneuvering room (by phone) clocks with the frequency time standard. If necessary, direct them to be reset by the Time Piece Petty Officer.

(16) Plot and maintain fix expansion as directed by the Navigator

(17) Obtain a fix whenever possible by all available means.

3. Organizational Relationships. The QMOW reports to:

a. The Chief of the Watch for all matters concerning routine watch functions.

b. The OOD, Navigator, and Assistant Navigator for all matters concerning the safe navigation of the ship.

c. The Navigation Division LPO/Assistant Navigator (as applicable) for all matters concerning routine administration.

R) **2103 NAVIGATION WATCH (SSN)**

1. **Basic Function.** The Navigation Watch is responsible to the OOD for the proper operation of the electronic navigation equipment and assisting in the safe navigation of the ship. The Navigation Watch and Quartermaster of the Watch will work together as a team in this regard. He will assist in determining the position of the ship by all electronic means as prescribed by the Navigator and provide the fix information promptly to the QMOW. In
R) addition, he will provide SINS/DMINS/ESGN/RLGN position as required by the QMOW while keeping himself fully informed of the ships position in relation to the intended track so that he can bring any ambiguity or discrepancies immediately to the attention of the QMOW, OOD, ANAV, and Navigator.

2. **Duties, Responsibilities and Authoritv**

a. The Navigation Watch is responsible. for:

(1) Ensuring operation of all electronic navigation equipment.

R) (2) Performing SINS/DMINS/ESGN/RLGN resets when directed by the Navigator.

(3) Obtaining electronic fix information as required by the QMOW.

(4) Being cognizant of electronic navigation equipment status at all times and immediately reporting any equipment malfunction to the OOD, Navigator, ANAV, and QMOW.

3. **Organizational Relationships.** The Navigation Watch reports to:

a. The Chief of the Watch for all matters concerning routine watch functions.

b. The OOD and Navigator on matters which concern the safe navigation of the ship.

c. The Navigation Division Officer and the Navigation Division LPO for all matters concerning routine administration.

R) **2104 NAVIGATION CENTER SUPERVISOR (SSBN)**

1. **Basic Function**

a. The Navigation Center Supervisor is responsible for the proper operation of the Strategic Navigation Subsystem in support of the Strategic Weapons System.

b. The Navigation Center Supervisor is responsible to the OOD for assisting in the safe navigation of the ship. He will determine the position by all means available in the Navigation Center as prescribed by the Navigator and provide the information promptly *to* the QMOW. He will provide SINS/ESGN(M) position to the QMOW. He will keep himself fully informed as to position kept by the QMOW and the intended track of the ship so that he can bring any ambiguity or discrepancies to the attention of the Navigator **and the OOD.**

c. The Navigation Center Supervisor will normally be the senior Electronics Technician standing watch in the Navigation Center for each section. If more than one individual in a section is a qualified Navigation Center Supervisor, the watch may rotate within the section when approved by the Navigator.

2. Duties, Responsibilities and Authoritv

a. The Navigation Center Supervisor shall:

(1) Supervise and direct the activities of the Navigation Center Watch/Navigation Center Technician (Non-TNCP TRIDENTS only).

(2) Ensure that all equipment operation and all Strategic Navigation Subsystem evolutions are performed per Navigation Standard Operating Procedures (NOPs) unless specific approval to deviate from these procedures has been obtained from the Navigator. Ensure authorized deviations are logged in the Strategic Navigation Subsystem Log.

(3) Be prepared to take or direct proper and correct action in the event of equipment casualty and ensure that accurate Strategic Navigation Subsystem outputs are continuously available to the Strategic Weapons System.

(4) Make recommendations to the Navigator and OOD concerning fix requirements, resets of SINS/ESGN(M), ship's courses to be steered for best LORAN reception (if applicable) and equipment status. Keep the Navigator and OOD informed of all problems in the Navigation Center, including equipment problems and other problems which affect the reliability and/or accuracy of the Strategic Navigation Subsystem.

(5) Provide fix information to the QMOW when obtained or at prescribed intervals.

(6) Provide the QMOW with master SINS/ESGN(M) positions at the interval prescribed to permit evaluation with other position-keeping data. In addition, he shall familiarize himself with the intended track, boundaries of the operating areas, and locations of any hazards to navigation in the vicinity so that he can monitor SINS/ESGN(M) positions to be clear of these limits during the interval between the plotting of SINS/ESGN(M) positions.

(7) Obtain soundings as prescribed by the Navigator and the OOD. Notify the OOD immediately of a significant discrepancy in soundings and of any sounding shallower than the RED or YELLOW sounding.

(8) Reset the SINS/ESGN(M) when approved by the Navigator .

(9) Perform such other duties as the Navigator, Navigation Division Officer, or the Navigation Division Leading Petty Officer shall direct.

b. Prior to relieving the watch the Navigation Center Supervisor shall:

(1) Ascertain the condition and status of all Strategic Navigation Subsystem equipment.

(2) Review the ship's navigational situation with the QMOW and the OOD including the ship's position, how it was determined, the intended track, uncertainty in ship's position based on fix expansion, and any potential hazards to navigation.

(3) Determine SINS/ESGN(M) reset requirements and all procedural guides and Navigation Operating Procedures (NOPs) in progress .

(4) Determine the scheduled time and type of the next fix.

(5) Determine the status of any unexecuted orders.

(6) Sight all publications on the watch-to-watch inventory and accept custody by signing the inventory sheet. Any discrepancies in the inventory shall immediately be brought to the attention of the Navigator. In the event of Battle Stations Missile and the absence of the Navigator, ensure that the Navigation Subsystem is brought to condition 1SQ to support the Strategic Weapons System per the NOPs.

3. Organizational Relationships. The Navigation Center Supervisor reports to:

a. The Chief of the Watch for all matters concerning routine watch functions.

b. The OOD and Navigator for all matters concerning Strategic Navigation Subsystem support of the Strategic Weapon System.

c. The **OOD** for matters concerning the ship's position and depth.

d. The Navigation Division Officer and the Navigation Division LPO for all matters concerning routine administration.

R) **2105 NAVIGATION CENTER TECHNICIAN INON-TNCP)**

1. Basic Function. The Navigation Center Technician will function as a monitor of all equipment assigned to the Navigation Electronics Division to

ensure proper operation. Prior to going to periscope depth and on the surface, the Navigation Center Technician will man ESM.

2. Duties, Responsibilities and Authority. The Navigation Center Technician shall:

a. Assist the Navigation Center Supervisor with such duties as he may direct.

b. Be familiar with emergency procedures for all navigational equipment as specified by operating procedures and be prepared to take immediate action as directed by the Navigation Center Supervisor.

c. Prior to relieving the watch, ascertain the status of all equipment and switch positions indicated on the Navigation Control Console, Navigation Center Switchboards, and Electromagnetic Logs.

3. Organizational Relationship. The Navigation Center Technician reports to the Navigation Center Supervisor.

2106 NAVIGATION CENTER WATCH (SSBN) (R

1. Basic Function. The Navigation Center Watch shall normally stand his watch at the Navigation Control Console (NCC) and shall monitor and operate the console as directed by the Navigation Center Supervisor.

2. Duties,RResponsibilities and Authority. The Navigation Center Watch shall:

a. Operate the NCC as directed by the Navigation Center Supervisor.

b. Monitor the equipment status alarms, executive alarms, auxiliary Display Terminal, and report malfunction indications to the Navigation Center Supervisor.

c. (Non-TNCP TRIDENT) Monitor the data printed on the X-Y plotter at least every six minutes and report any unusual trends to the Navigation Center Supervisor.

d. Be familiar with the emergency procedures for all Strategic Navigation Subsystem equipment and be prepared to take corrective action in the event of equipment failure to maintain Strategic Navigation Subsystem outputs to the Strategic Weapons System.

3. Organizational Relationship. The Navigation Center Watch reports to Navigation Center Supervisor.

2107 RADIO SUPERVISOR (SSBN) (R

1. Basic Function. The Radio Supervisor is responsible to the OOD to maintain and operate the Integrated Radio Room (IRR) to maintain Strategic

Connectivity during alert patrol operations. He will supervise the Radio Operators in the performance of their duties. The Radio Supervisor is normally the senior communications ET on watch who is qualified Radio Supervisor.

2. Duties, Responsibilities and Authority

a. The Radio Supervisor shall:

(1) Operate and align the IRR to maintain strategic connectivity at all times while on alert patrol per COMSUBLANT/COMSUBPACINST guidance (CTF 144/CTF 134).

(2) Supervise the actions of the on-watch Radio Operator to ensure that all broadcast messages of interest to the ship are copied per the applicable standard operating procedures, CO's Standing Orders, and applicable directives.

(3) When the ship is on alert, the Radio Supervisor will ensure that the IRR is configured to continuously copy the submarine broadcast and will guard, COPY, or listen to other frequencies and circuits as directed in the ships communications plan and applicable directives.

(4) Immediately inform the Officer of the Deck of all incoming EAMs, and execute the immediate actions prescribed in the CO's Standing Orders and other applicable guidance for initial handling and processing of EAMs.

(5) Ensure that one Radio Operator is available to man ESM (TNCP Trident), to man stations to deploy or retrieve deployed antennas, or to perform other actions as directed by the Officer Of the Deck.

b. Ensure that appropriate actions are taken to restore communications during loss due to a shipboard malfunction. Immediately inform the OOD of the loss of any broadcast or component of the broadcast.

3. Oruanizational Relationships. The Radio Supervisor reports to:

a. The Officer of the Deck for matters pertaining to maintenance of strategic connectivity.

b. The Chief of the Watch for all matters concerning routine watch functions.

c. The Communications Officer for matters concerning the proper operation of the IRR.

R) **2108 RADIO OPERATOR (SSBN)**

1. Basic Description. The Radio Operator assists the Radio Supervisor in the operation of the Integrated Radio Room and antenna systems to maintain

continuous communications. A second Radio Operator will be designated to man ESM prior to going to periscope depth and on the surface with Radar secured (TNCP TRIDENT).

2. **Duties, Responsibilities and Authority**. The Radio Operator will:

a. Operate the IRR as directed by the Radio Supervisor. IRR operating procedures provide guidance for routine and emergency external communications.

b. While on alert, the Radio Operator shall be stationed in the radio room operating antenna systems, or routing priority message traffic. When not on alert, and with the permission of the Officer of the Deck, one or both operators may leave the radio room to route record message traffic.

3. **Organizational Relationships**. The Radio Operator reports to the Radio Supervisor.

2109 RADIOMAN OF THE WATCH (RMOW) (SSN) (R

1. **Basic Function**. The RMOW is responsible to the Officer of the Deck for operation of the radio room per current operation orders and applicable procedural documentation.

2. **Duties, Responsibilities and Authority**

a. Communication systems operating procedures provide guidance to the RMOW for routine and emergency external communications.

b. The RMOW shall be stationed in the radio room except below communications depth when, with permission of the Officer of the Deck, may leave the radio room to route record message traffic. With the Commanding Officer's concurrence, the RMOW may be "on call" when the ship is underway and submerged below periscope depth.

c. When more than one communications ET is engaged in operations in the radio room, the RMOW shall be in overall charge. The RMOW shall obtain the assistance of off-watch personnel when, in his opinion, such assistance is required to expedite the concurrent use of several circuits or to avoid an excessive traffic backlog.

d. When at communications depth, the RMOW will always copy the fixed submarine broadcast and will guard, copy, or listen to other frequencies and circuits as directed in the ships communications plan.

3. **Organizational Relationships**. The RMOW reports to:

a. The Chief of the Watch for all matters concerning routine watch functions.

b. The Officer of the Deck on matters affecting current communications and on the content of tactical and operational traffic.

c. The Communications LPO on all aspects of the radio room.

R) **2110 ESM WATCH**

1. **Basic Function.** The ESM watch is responsible to the Officer of the Deck for the conduct of an efficient search of the radar frequency **bands, for** reporting all contacts to the Officer of the Deck, and for providing bearings to contacts as directed by the Officer of the Deck. The ESM Watch is responsible for the proper set up of the IFF equipment.

2. **Duties, Responsibilities and Authority**

a. The ESM watch shall be stationed prior to the ship's ascent to periscope depth and shall remain stationed as long as the ship remains at periscope depth. The ESM watch shall be manned during surface operations when directed by the Commanding Officer.

b. The ESM watch shall conduct a quick search of all radar frequency bands as soon as an ESM capable antenna is exposed. He shall report all contacts detected to the Officer of the Deck. Reports shall not be delayed when contacts cannot be classified. While at periscope depth, the ESM watch shall report all further contacts, and pursue and review the classification of all contacts held. When directed by the OOD, the ESM watch shall provide DF bearings to reported contacts.

c. The ESM watch shall record and document contacts per NWP 3-13.10.1.

d. The ESM watch shall obtain the assistance of off-watch ESM operators when, in his opinion, such assistance is required to expedite ESM operations. When more than one ET is engaged in operations in ESM, the senior ESM watchstander present shall be in overall charge.

3. **Organizational Relationships.** The ESM watch reports to:

a. The Officer of the Deck for tactical information.

b. The Chief of the Watch for all matters concerning routine watch functions.

c. The Communications LPO on all aspects of the ESM suite.

R) **2111 RADAR OPERATOR**

1. **Basic Function.** The Radar Operator operates the Radar when required. He reports tactical information to the OOD (or Contact Coordinator when stationed), and navigation information to the QMOW (or navigation piloting party when stationed).

2. **Duties, Responsibility and Authority**

a. The Radar Operator shall provide contact range and bearing information on contacts as directed by the OOD, or Contact Coordinator (when stationed). The Radar Operator shall plot contacts as directed by the OOD/Contact Coordinator on the display and solve relative motion problems as directed. He will be proficient at determining what contacts are collision threats. The Radar Operator shall be familiar with the use of the maneuvering board in solving contact course, speed, and CPA in multiple contact situations.

b. The Radar Operator shall provide range and bearing information on charted topographical features and navigational aids to the QMOW, or the navigation piloting party (when stationed), for radar navigation fixes.

c. The Radar Operator shall shorten the scale periodically or as directed by the Contact Coordinator. This reduction in scale is specifically to check for small close-in vessels or objects that are not detectable on longer range scales.

3. **Organizational Relationships**. The Radar Operator reports to:

a. The OOD or Contact Coordinator (when stationed) for tactical information on Radar contacts.

b. The Navigator for support of the secondary navigation plot.

c. The Navigation Division Officer for operation of the Radar equipment.

d. The Chief of the Watch for all matters concerning routine watch functions.

2112 LOOKOUT. The Lookout is that member of the underway watch qualified by the Navigator and assigned by the Watch, Quarter, and Station Bill. His specific duties are delineated in reference (a). (R

2113 AUXILIARY ELECTRICIAN FORWARD (AEF) (R

1. **Basic Function**. The AEF is that watchstander responsible for the security and integrity of forward ship's service electrical systems, ship's control, atmosphere monitoring, and interior communications equipment forward of the reactor compartment (Auxiliary Machinery Room Two for SSBNs). Either he or the Auxiliaryman of the Watch shall normally be in the control room. He may rove throughout the ship in the performance of his duties, keeping the Chief of the Watch informed of his location.

2. **Duties, Responsibilities and Authority**

a. At least once each hour, the AEF shall tour all levels of all spaces forward of the reactor compartment (forward of the missile compartment for SSBNs), noting conditions of running equipment, bilges, periscope and mast

wells, etc. Additionally, he will ensure that all on service depth indicators are compared every hour. He will be alert for overheating bearings and motor windings, arcing, oil or water accumulations endangering electrical equipment, unusual noises, and abnormal vibrations. He will perform the ventilation lineup for battery charges as directed. He shall take the required readings during battery charges or test discharges and, with Maneuvering's permission, take specific gravities for reporting to the Officer of the Deck and the Engineering Officer of the Watch daily and whenever the word to secure from reduced electrical power is passed. He shall make torpedo room (and missile) compartment inspections as directed by applicable Weapons Department instructions. (R

3. Organizational Relationships

a. The Auxiliary Electrician Forward reports hourly to the Chief of the Watch for all equipment operating conditions and the OOD for all atmosphere control readings/analysis.

CHAPTER II

WATCH ORGANIZATION

SECTION 2 - INPORT WATCHES

2200 GENERAL

1. In port watches shall be assigned per reference (a) and a written watchbill approved by the Executive Officer or the Ship's Duty Officer. A member of the NAVOPS Department may be designated to stand any of the following inport watches:

a. Duty Chief Petty Officer

b. Below Decks Watch

c. Petty Officer of the Deck and Topside Sentry

d. Security Guard

e. Duty Navigation Electronics Technician

f. Duty Guard Mail Petty Officer

g. Navigation Center Watch (SSBN)

h. Missile Compartment Roving Patrol (SSBN)

i. Duty Radioman

j. Battery Charging Electrician Forward

2. The duties of the Duty Chief Petty Officer, Below Decks Watch, Petty Officer of the Deck, Duty Guard Mail Petty Officer, and Security Guard are defined in reference (b). The duties of the Missile Compartment Roving Patrol are defined in reference (k).

3. Before standing a watch, a man must be certified in writing by the designated officer as having satisfactorily completed the qualification for that watch. Qualification requirements for each NAVOPS Department watch are given in Chapter IV of this manual and the applicable qualification

instructions. NAVOPS Department personnel standing a watch under the cognizance of another department shall be governed by the procedures, organizational relations, and qualification requirements delineated by that department.

4. An unqualified watchstander may stand an instruction watch only under the direct supervision of a qualified watchstander who retains full responsibility for the conduct of the watch.

2201 DUTY NAVIGATION ELECTRONICS TECHNICIAN

1. **Basic Function**. The Duty Navigation Electronics Technician is the direct representative of the Navigator with duties involving navigation readiness, divisional electronic equipment, visual communications, log keeping, ship's safety, and protocol.

2. **Duties, Responsibilities and Authority**.

a. In addition to performing the duties of watches as assigned by the section leader, the Duty Navigation Electronics Technician shall:

(1) Maintain the security and material condition of divisional electronic equipment and spaces.

(2) Keep the Ship's Duty Officer and LPO advised of equipment condition and effect equipment repairs when necessary, placing equipment out of commission only with the permission of the Ship's Duty Officer.

(3) Stow all navigational equipment, inventory classified material and equipage, and lock Navigation Division stowage after mooring.

(4) Log the draft forward and aft upon mooring, report any abnormalities to the Duty Chief Petty Officer and Duty Officer.

(5) Supervise morning and evening colors. Ensure that a proper jack, ensign, pennant or flag is used and properly displayed. If appropriate, ensure that proper day shapes are shown. Ensure that the anchor lights are tested 30 minutes prior to evening colors.

(6) Ensure that the Petty Officer of the Deck makes all necessary entries in the Topside Watch Log by checking the log prior to being relieved of the duty. The Duty Navigation Electronics Technician will verify that the Petty Officer of the Deck makes entries in the Topside Watch Log as events requiring entries occur.

(7) Ensure that the times of sunrise and sunset are available to the Petty officer of the Deck, and those for the following day available to the yeoman for inclusion in the Plan of the Day.

(8) Maintain the Ship's Deck Log.

(9) Ensure harbor, approach, and operating area charts are available in case of emergency sortie or dispersal.

(10) Review all Notices to Mariners, NAVAREA's, Broadcast Notice to Mariners, Local Notice to Mariners, and HYDROLANT/HYDROPACs received during his duty day and bring pertinent notices to the attention of the Duty Officer, the Navigator, and Assistant Navigator.

(11) Ensure that all spaces assigned to the Navigation Division are kept clean and shipshape at all times.

(12) Remain cognizant of the status of all navigational equipment and ensure that the Duty Chief Petty Officer, Duty Officer, and Navigator are informed of any derangement.

(13) Provide the Duty Officer with sufficient navigational support to maneuver and anchor the ship safely if it becomes necessary to get the ship underway without the Commanding Officer, Executive Officer, or the Navigator onboard.

(14) When the ship is anchored, perform the duties of the QMOW per the anchoring bill of reference (c) .

(15) Ensure that SINS/DMINS/ESGN(M)/RLGN is started up and settled in preparations for the next scheduled underway period. Ascertain the readiness of all electronic navigation equipment to support underway operations. (SSN) I (R

3. Organizational Relationships. The Duty. Navigation Electronics Technician reports to:

a. The Duty Officer and Navigator on all navigational matters.

b. The Duty Chief Petty Officer for all matters concerning watch functions.

2202 NAVIGATION CENTER WATCH (SSBN)

1. Basic Function. At least one watchstander, qualified as Navigation Center Watch, will be present in the Navigation Center when any inertial navigator is energized.

2. Duties, Responsibilities and Authority

a. The Navigation Center Watch shall:

(1) Coordinate the operation of all equipment associated with the Strategic Navigation Subsystem. Monitor alarms, indicators and readouts to detect any malfunction of Strategic Navigation equipment.

(2) Maintain logs and records per applicable directives.

(3) Provide adequate security for Strategic Navigation equipment and material. Ensure that personnel are authorized to enter into the Navigation Center. Ensure that IMA or shipyard work to be conducted in the Navigation Center is authorized by a properly authorized work request approved by the Navigator. Maintain a watch-to-watch inventory of all cryptographic material and material classified SECRET or above which is not continuously locked in its designated stowage area. At least one qualified Navigation Center Watchstander, with a SINS/ESGN(M) equipment maintenance NEC, will be readily available for assistance, if required, whenever a SINS/ESGN(M) is operating.

(4) Be responsible for the watch-to-watch cleanup of the Navigation Center.

(5) Ensure that all equipment operation is conducted per the appropriate Navigation Operating Procedures.

(6) Assure that the periscope optic cover is installed whenever any periscope that is not being used is raised to a point where the untapered barrel is in the upper bearing.

b. If an equipment malfunction occurs, the Navigation Center Watch shall take immediate and proper corrective action to prevent equipment damage.

c. If an emergency sortie occurs, assist the Duty Navigation Electronics Technician in piloting the ship to open waters. Take all steps necessary to restore the navigational capability of the Strategic Navigation Subsystem in a timely manner. For a routinely scheduled underway, conduct all required preunderway checks as early as possible.

3. Organizational Relationships. The Navigation Center Watch reports to:

a. The Duty Officer, Navigator, Division Officer, and Navigation Leading Petty Officer in matters concerning the operation and maintenance of equipment associated with the Strategic Navigation Subsystem.

b. The Duty Chief Petty Officer for all matters concerning watch functions.

2203 DUTY RADIOMAN

1. Basic Function. The Duty Radioman, as the direct representative of the Communications Division Officer, is responsible for the correct handling of radio traffic and other communications matters in port. Regardless of radio guard arrangements in port, there shall be at least one member of the NAVOPS Department in a duty status qualified as Duty Radioman.

2. Duties, Responsibilities, and Authority

a. The Duty Radioman shall carry out his duties per Communications Division procedures.

b. The Duty Radioman shall maintain the security, cleanliness, and material readiness of the radio room.

c. The Duty Radioman shall keep the Ship's Duty Officer advised of the status of Communications Division equipment. If repair/replacement of communications equipment is required, a qualified technician must be present and the Ship's Duty Officer and LPO kept advised of the status of the equipment. If necessary, placing equipment out of commission will be done by a qualified technician with the permission of the Ship's Duty Officer.

d. The Duty Radioman will process all incoming/outgoing message traffic as required by higher directives and ship's instructions.

3. **Organizational Relationships.** The Duty Radioman reports to:

a. The Ship's Duty Officer, Navigator, and Communications Officer for matters concerning incoming or outgoing communications.

b. The Duty Chief Petty Officer for all matters concerning watch functions.

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CHAPTER III

MAINTENANCE AND MATERIAL

SECTION 1 - MAINTENANCE RESPONSIBILITIES

3100 GENERAL

1. NAVOPS Department maintenance procedures shall be per references (b), (e), (j), and the SSP directed Planned Maintenance Management Program (PMMP)(SSBN).

2. Every effort will be made to conduct required preventive maintenance on schedule. Some steps of the maintenance procedures cannot be performed until operations permit. Maintenance shall be performed as scheduled or as soon afterwards as possible. Deviations from these schedules may be authorized only by the Navigator.

3. No alteration or modification to any NAVOPS Department equipment or system shall be effected without an authorizing document (A&I, SHIPALT, SPALT, TRALT, TEC, TCMOD or Field Change) or without the Commanding Officer's express approval for emergency repairs.

4. The Tag-out Log, Equipment Status Log, Out of Commission Log procedures and all applicable safety precautions shall be strictly followed by all NAVOPS Department personnel when performing maintenance on any equipment.

5. Maintenance shall be performed as directed by the Communications and Navigational Division Leading Petty Officers. No person shall be allowed to perform or attempt to perform any maintenance unless they have been formally schooled on the equipment or certified by the appropriate LPO.

3101 MAINTENANCE RESPONSIBILITIES

1. The Navigator shall be responsible for the proper operation, immediate repair, routine preventive maintenance and cleanliness of the equipment assigned to the department. This responsibility includes carrying out inspections and ensuring that tests, adjustments, calibrations, and repairs are carried out per appropriate technical documentation, manufacturers instructions, and/or directives of higher authority.

2. Maintenance responsibility includes the proper keeping of records of preventive maintenance, repairs, alterations, and the submission of required reports.

3. As a general policy, repair of failed equipment shall begin immediately after a failure occurs. However, if an item of equipment is operating improperly but is still serviceable, the Division Officer will report the circumstances to the Navigator and the OOD/Duty Officer, who will direct repairs and arrange any necessary outside assistance. All such out-of-commission equipment and deficiencies shall be logged in the ship's Equipment Status Log.

4. In order to ensure the acceptable quality of all repairs and alterations, the Navigator is responsible for the proper conduct of adequate testing of affected systems as prescribed by COMSUBLANTINST 4355.2/COMSUBPACINST 4355.6. It is recognized that such testing may have to be deferred because of current operational restrictions, but the maintenance is not to be considered satisfactorily completed until such testing is performed.

5. Personnel involved in maintenance on electrical or electronic equipment must be fully aware of the hazards involved and must comply with all applicable safety precautions. Safety precautions are contained in the NAVSHIPs Technical Manual and reference (b).

3102 CLEANING AND PRESERVATION

1. The NAVOPS Department is assigned spaces and equipment for cleaning per the Cleaning, Preservation, and Maintenance Bill of reference (b). Division cleaning responsibilities are assigned in the ship's Cleaning, Preservation, and Maintenance Bill.

2. All NAVOPS Department personnel will be familiar with the ship's Cleaning, Preservation, and Maintenance Bill and strictly comply with the general procedures for cleanliness and preservation contained therein. The organization of the NAVOPS Department for cleaning will be the same as for administration.

3. At least once a day the Division Officer and Leading Petty Officer will inspect all spaces assigned. When the Division Officer and LPO are not onboard, the inspections will be made by the senior department representative onboard.

4. The Navigator shall ensure that all areas under his cognizance in need of preservation and painting are included in the schedule of work to be accomplished.

3103 DIVISION MAINTENANCE ASSIGNMENTS

1. General maintenance assignments for NAVOPS Department are described in reference (b). This section assigns specific responsibilities to the divisions within the NAVOPS Department.

2. The Communications Division shall be responsible for the operation and maintenance of the following equipment:

a. All receivers, transmitters, and transceivers installed in the radio room.

b. All installed antennas, including electronic portions thereof and associated fairings, electronic cabling, coupling, patching, and switching equipment but not including hoist mechanisms, bearings or associated hydraulic controls or position-indicating circuits (excluding the GPS/TRANSIT antenna on SSBNS).

c. All radio teletype equipment

d. All cryptographic equipment

e. All emergency radio equipment

f. All bridge-to-bridge transceivers

g. IFF systems

h. ESM systems

i. RDF equipment

j. Photographic equipment

k. The following portions of any periscope installed and so equipped:

(1) Communications and intercept antennas

(2) The contents of the E & E adapters, including torque-assist drives, reticle-illumination and associated circuits.

(3) Image-forming, monitoring and recording devices of any type including headwindow and eyepiece heaters.

1. Special purpose equipment installed on a temporary basis to augment the ship's existing electronic support measures configuration.

m. All onboard test equipment supporting the above.

n. Additional items as defined by the Navigator.

3. The Navigation Division shall be responsible for the operation and maintenance of the following equipment:

a. Electronic navigation equipment including the DDRTs, electromagnetic underwater log, radar, and the gyrocompasses.

b. (SSBN) All Strategic Navigation equipment including the GPS/TRANSIT antenna and associated fairing, electronic cabling, coupling and switching equipment and position indication circuits but not including hoist mechanisms, bearings, or associated hydraulic controls or position indication circuits.

c. All ship's control electronics including the Ship's Control Panel, Ballast Control Panel, Ship's Control Station and associated amplifiers, signal converters, switchboards, sensors, signal transmitters, and receivers.

d. The ship's digital depth gauges and all associated amplifiers, signal converters, switchboards, sensors, signal transmitters and receivers excluding piping and sea sensing valves.

e. All ship's interior communications circuits including amplified and sound powered systems, and the portable ship control unit.

f. All ship's atmosphere monitoring equipment excluding radiation monitoring equipment.

g. All hydraulic plant indication circuits.

h. All valve indicating and control circuits except reactor and steam propulsion plant valves.

i. All flow, bilge level and tank level monitoring circuits forward of the Reactor compartment.

j. All ship's signaling and navigation equipment, except the installed ship's whistle.

k. All plotting and drafting equipment used in the navigation of the ship.

1. Steering and Diving Indications and Control

m. Ship's Entertainment systems

n. Ship's copiers

o. Additional items as defined by the Navigator.

p. Trim/Drain system indications and control.

q. Underwater Logs

r. Microfiche Reader/printer

s. Missile Compensation System (SSBN)

t. Hovering/Depth Control System

u. All onboard test equipment supporting the above.

4. NAVOPS Divisions shall render assistance to the other divisions when the onboard repair of equipment can be expedited by such assistance.

CHAPTER III

MAINTENANCE AND MATERIAL

SECTION 2 - MAINTENANCE ADMINISTRATION

3200 GENERAL

1. Material readiness results from an actively pursued preventive and corrective maintenance program. The administration of maintenance must be simple and thorough. The following article delineates minimum administrative requirements for the NAVOPS Department maintenance program.

3201 THE SHIP'S MAINTENANCE AND MATERIAL MANAGEMENT (3M) PROGRAM

1. The 3M Program will be implemented in the NAVOPS Department per references (e) and (i).

3202 AVAILABILITY AND UPKEEP PLANNING

1. Maintenance to be accomplished by an outside activity will be planned per reference (i) as well as applicable Group and Squadron instructions.

2. Prior to scheduled availability, ship's force maintenance plans will be prepared during a scheduling conference in compliance with applicable squadron directives. At this the Navigator, division officers, and division LPOs will identify all known NAVOPS work and prioritize the work to prevent conflicts with repair activity, other ship's force work, or the ship's operating schedule.

3203 SWS PREVENTIVE MAINTENANCE MANAGEMENT PLAN (SSBNS)

1. All Strategic Navigation Subsystems and hovering and missile compensation equipment will be maintained per current Strategic System Program Office directives for implementation of PMMP.

2. Any exceptions will be immediately reported to and resolved by the Navigator.

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CHAPTER III

MAINTENANCE AND MATERIAL

SECTION 3 - MAINTENANCE DOCUMENTATION

3300 GENERAL

1. This section discusses items of documentation which must be initiated and completed in the process of conducting corrective and preventive maintenance on NAVOPS Department equipment. Section 3303 discusses conditions under which alterations and associated documentation are accomplished.

3301 CORRECTIVE MAINTENANCE . Corrective maintenance includes all efforts expended to correct equipment and space derangement, damage, substandard performance and preservation.

1. Requirements for corrective maintenance, when identified and not immediately corrected, shall be documented in applicable equipment status log. The Forward Equipment Status Log is maintained per COMSUBLANT/COMSUBPACINST 4790.5. Requirements for corrective maintenance on other than forward equipment and spaces should be documented in the equipment status log of the applicable division. Conversely, personnel from other divisions may make entries in the forward equipment status log.

2. The Communications Officer shall designate those items in the OC01 section for which a deferral (OPNAV 4790-2K) is required.

3. The Navigation Division Officer shall designate those items in the NE01 section for which a deferral (OPNAV Form 4790-2K) is required.

4. Deferrals and work requests shall be based on entries in the equipment status log and shall be executed per reference (e) and TYCOM 3M directives.

3302 PLANNED MAINTENANCE. Planned maintenance includes all recurrent tests, inspections, calibrations, replacements, lubrications, alignments and detailed cleaning operations in support of NAVOPS Department equipment.

1. Planned maintenance action shall be scheduled and documented per PMS directives. For equipment having no established maintenance requirements (MIPs), the division LCPO shall:

a. Initiate feedback reports to obtain the required MIPs and MRCs.

b. Formulate, subject to approval of the Navigator, locally prepared MIPs and MRCs based on the available technical documentation, for use pending receipt of documentation approved by higher authority.

3303 ALTERATIONS. Any change to the configuration of the ship as represented by current drawings and applicable technical publications constitutes an alteration. Reference (j) establishes requirements for obtaining approval of alterations.

1. Alterations must not be accomplished by ship's force until authorized by proper higher authority.

2. Alterations status shall be documented per equipment status log instructions and managed per the alteration management system. Ensure that a configuration change is supported by a completed OPNAV 4790-CK Ship's Alteration Form.

CHAPTER III

MAINTENANCE AND MATERIAL

SECTION 4 - OPERATION OF EQUIPMENT

3400 GENERAL. This section of the NAVOPS Department Organization and Regulations Manual provides guidance to support the requirements for operation per approved procedures.

3401 OPERATING PROCEDURES

1. NAVOPS Department equipment shall be operated, including maintenance actions, in strict accordance with approved operating procedures. Operating procedures are provided in reference (c), OD52591/61600 (SSBN), technical manuals and locally prepared and approved operating procedures.

2. The Navigator is responsible for ensuring that equipment is operated per approved procedures. The Navigator shall ensure that locally prepared NAVOPS Department operating procedures are prepared per approved technical manuals or other applicable instructions and that such operating procedures specifically provide for system startup, system operation, system shutdown, and the normal shutdown condition.

3. Up-to-date copies of equipment operating procedures shall be available in sufficient number and located in appropriate places so that each watchstander has access to procedures applicable to his station for use in performing operations at that station.

4. Procedures or chapters should not be removed from or reorganized within any volume of component technical manuals unless specifically permitted by instructions for handling the particular document. All technical manuals should be kept intact in the format prescribed for the particular ship to ensure that they are correctly maintained.

3402 CHANGES TO PUBLICATIONS AND PROCEDURES. A positive method should be followed to ensure that all approved changes to procedures are incorporated into all applicable operating procedures or other ship's documents affecting equipment operation. This is extremely important where changes are to be incorporated upon completion of a field change. The procedure for handling changes shall contain the following provisions:

1. All approved changes to publications and procedures received by the ship should be noted. The Navigator should determine what areas are affected by the changes and whether requalification of watchstanders is required. A checklist (Figure 3-1) should be used.

2. All procedures and other documents affected by the changes should be reviewed to determine how the changes should be incorporated. Upon revision, ship's operating procedures or other documents affected shall be verified to ensure they have been revised properly. This normally will involve a walk-through of the revised procedures.

3. New operating procedures should be handled in the same manner as approved changes to procedures.

4. When a new or revised operating procedure has been issued, it will be routed to all NAVOPS Department personnel affected by it. A department routing sheet shall be attached to ensure that affected individuals have read and understand the revised procedures. If determined by the Navigator, all affected individuals shall re-qualify using the new procedures.

5. When a change to a publication is issued, numerous documents could be affected. Changes to component technical manuals and ship's information books may affect operating instructions, preventive maintenance cards and instructions, material history records, log sheets, repair parts lists, etc. The ship should endeavor to keep to a minimum the number of ship's documents that are affected by a single change. One effective way of accomplishing this is to limit the number of places in ship's records where a given procedure is contained. (For example, it should not be necessary to have an instrument alignment procedure in the technical manual and in ship's operating instructions; instead, the instructions should reference the procedure in the technical manual. If a change to this alignment procedure is issued, only the technical manual needs to be changed.)

FIGURE 3-1

SAMPLE CHECK LIST FOR AUTHORIZED CHANGES

The following check list should be filled out for all approved changes to operating procedures and technical manuals. The Navigator should fill out the list. Beside each item on the check list, he should indicate whether the change is applicable or not. The Division Officer/LCPO responsible for the equipment involved should be responsible for ensuring that all applicable items covered by the changes are properly modified. Upon completion of action for all items on the check list, the cognizant Division Officer/LCPO should return the list to the Navigator.

AUTHORIZED CHANGE CHECK LIST

DATE_____ SERIAL NO._____ CHANGE NO._____

APPLICABLE TO_____
(Identification of Manual)

PRIMARY ACTION OFFICER/LCPO_____

COMPLETED REQUIRED_____
(DATE)

ITEM	REQUIREMENTS (Navigator Indicate) Applicability (Yes/No/Div.)	Action By	Prior To	Action Comp.
1. PROCEDURES				
a. Ship's procedures	_____	_____	_____	_____
b. Posted Oper. Inst.	_____	_____	_____	_____
c. Ship's instructions	_____	_____	_____	_____
2. TRAINING				
a. Read change	_____	_____	_____	_____
b. Read training summary	_____	_____	_____	_____
c. Lecture	_____	_____	_____	_____
d. Seminar	_____	_____	_____	_____
e. Walk through	_____	_____	_____	_____
f. Requalification	_____	_____	_____	_____
3. LOGS/RECORDS	_____	_____	_____	_____
4. PREVENTIVE MAINT. REC.	_____	_____	_____	_____
5. ENTRY OF CHANGE	_____	_____	_____	_____

ALL ACTION COMPLETE_____ _____
(DATE) (Signature Primary Action Officer)

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CHAPTER IV

TRAINING AND QUALIFICATION PROCEDURES

SECTION 1 - TRAINING

4100 TRAINING PROGRAM

1. The COMSUBLANT/COMSUBPAC Training Manual outline the requirements, responsibilities and methods for conducting the training necessary to train and qualify assigned personnel. In amplification of this program the following guidelines are provided for NAVOPS Department personnel.

2. The objective of the NAVOPS Department Training Program is to provide adequate training in the following areas:

a. Training for personnel assigned to the NAVOPS Department:

(1) Qualification training for:

(a) Quartermaster of the Watch

(b) Duty Navigation Electronics Technician

(c) Submarine Qualification

(d) Assistant Navigator

(e) Navigation Center Watch

(f) Radioman of the Watch (SSN)

(g) Navigation Watch (SSN)

(h) ESM Operator

(i) Duty Radioman

(j) Auxiliary Electrician Forward

(k) Radio Supervisor (TRIDENT)

(l) Radio Operator (TRIDENT)

(m) Navigation Center Supervisor (TRIDENT)

(n) Navigation Center Technician (Non-TNCP TRIDENT)

(2) Rate training

(3) General military training

(4) Leadership training

(5) Instructor training

(6) Academic, school, and factory training

(7) CPR Training and certification

(8) Electronic Navigation

(9) Section Tracking Party training

b. Training for other personnel.

(1) Training of Officers of the Deck/Junior Officers of the Deck.

(2) Practical navigation for Junior Officers.

(3) Training and qualification of the Navigation Watch.

(4) Training of Petty Officer of the Deck watchstanders regarding logs, instruments, military customs, and military courtesies.

(5) Training and Qualification of Lookouts.

(6) Training and Qualification of Helmsman.

(7) Training of the Navigation Piloting Party.

4101 RESPONSIBILITIES

1. **Navigator.** The Navigator as the Department Head has overall responsibility for training conducted within the NAVOPS Department.

2. **Department Leading Petty Officer.** The Department Leading Petty Officer shall act as the administrator of the NAVOPS Department training program as directed by the Navigator.

3. **Navigation Division Officer/Communication Division Officer.** The Navigation Division Officer/Communication Division Officer is responsible for administering and supervising the training program within his Division. He shall:

a. Keep abreast of each individual's progress in preparing for advancement in rating and provide such encouragement, guidance and direction as may be required to ensure progress at the maximum rate that is compatible with the individual's ability.

b. Ensure that all personnel meet their progress requirements for submarine qualification or requalification.

c. Observe each individual in the performance of his duties, with a view toward ensuring that required proficiency is achieved and maintained in all applicable practical factors and watchstanding.

d. Recommend personnel for schools per reference (d).

e. Ensure that qualified instructors are available to assist in the ship and department training programs.

f. Instruct Lookouts, Petty Officer of the Deck, and Helmsmen watchstanders.

g. Assist the Navigator in the training of Officers of the Deck, Junior Officers qualifying in submarines, and Navigation/Operations personnel.

h. Assist in ordering, administering, grading, and maintaining records of correspondence courses.

4102 TRAINING RECORDS AND REPORTS. Division training records shall be maintained by the Division Training Petty Officer per COMSUBLANT/COMSUBPAC Training Manual.

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CHAPTER IV

TRAINING AND QUALIFICATION PROCEDURES

SECTION 2 - QUALIFICATION

4200 OBJECTIVES. The objective of the Navigation/Operations Department Qualification Program is to establish and maintain a level of qualification for personnel assigned to the Navigation/Operations Department and personnel assigned to stand the Navigation Watch which will ensure their capability to safely and effectively carry out all assigned duties and responsibilities. The minimum requirements set forth herein will serve as a guide to the trainee and examiners. Effective accomplishment of these aims will depend on the individual efforts and initiative of all Navigation Department personnel.

4201 RESPONSIBILITIES

1. **Navigator**. The Navigator has overall responsibility for the Navigation/Operations Department Qualification Program. He will examine each qualification candidate and certify those who successfully complete the requirements. He will also decide when and if the qualification of any person is sufficiently in doubt as to require recertification. Recertification requirements are defined in reference (d) Article. 1100.1.h. Qualification schedules will be set by the Navigator on an individual basis, based on each man's professional background and qualification status and the ship's overall requirements. Reference (d) Article 8300.1 provides qualification goals.

2. **Division Officers**. The respective Division Officer will directly supervise the progress and execution of the qualification requirements assigned to each individual under his supervision and will be familiar with their qualification status and progress. It is his direct responsibility to ensure that each progresses at the maximum rate commnensurate with his ability, and when qualified, that the individual's proficiency is maintained. The Department Leading Petty Officer shall act as administrator of the Navigation/Operations Department Training Program as directed by the Navigator.

3. **Navigation Department Personnel**. All personnel assigned to the Navigation/Operations Department shall endeavor to complete the qualification requirements assigned them as quickly as possible.

NOTE: TRIDENT Class SSBN qualification cards can be found in the Squadron Consolidated Directives Manual.

4202 QUALIFICATION PROCEDURES

1. The NAVOPS Department qualification program is administered per reference (d).

2. Minimum requirements for NAVOPS Department watch station qualifications are contained in the **applicable qualification instruction(s) which are to be promulgated by the individual ship.** Each ship's qualification cards should reflect equipment actually onboard. Modified cards must cover the area listed in the enclosed qualification cards unless that equipment is not installed. Modified cards should be audited against the qualification cards of this instruction.

CHAPTER IV

TRAINING AND QUALIFICATION PROCEDURES

SECTION 3 - WATCH QUALIFICATION REQTJIREMENTS

4301 BASIC NAVIGATION/OPERATIONS DEPARTMENT QUALIFICATION CARD

NAME _____ RATE _____
DATE STARTED _____ DATE DUE _____

1. **Prerequisites**	**DATE**	**SIGNATURE**
a. Possess SECRET/TOP SECRET clearance. Valid SSBI for SC1 access when required. NATO certified (if applicable)		SECURITY MANAGER
b. Completed CMS PQS and be certified a "CRYPT0 USER" (Required for Communication Division personnel)		CMS CUSTODIAN
c. Completed Submarine Qualification Phase I and II		LPO

2. **Knowledge Requirements.** Demonstrate thorough knowledge of the following:

a. Required Reading:

(1) NODORM
(2) 3-M Manual (OPNAVINST 4790.4G) Chapters 1 and 5
(3) Security Manual (OPNAVINST 5510.1) Chapter 4, Sections 4-l to 4-3, **4-14,** Chapters 5, 6, 9, 11, 13, 16, and 24
(4) SSORM (COMSUBLANT/COMSDBPACINST 5400.39)

-R)

(5) Submarine Noise Reduction (Fleet Maintenance Manual 4790.3)
(6) COMSUBLANT/COMSUBPAC Lessons Learned (Classified Material and Maintenance Sections)

I have read and understood the information contained in the above items.

_____ _____
MEMBER DATE

b. Have a detailed knowledge pf watchstanding organization outlined in Chapters 1 and 2 of the NODORM. _____

c. Understand the duties assigned the Watch, Quarter, and Station Bill and In-Port Watch Bill. _____

d. Have a detailed knowledge of the ship's Equipment Status Log (ESL) and applicable procedures for its use. _____

e. Know the location of all damage control and first aid equipment in the Operations Department spaces. _____

f. Security areas of the ship: _____

(1) Where they are _____
(2) Entry requirements _____

g. Discuss the requirements for the safeguarding of classified material and publications. _____

h. Discuss whose permission is required to perform:

(1) Scheduled PMS _____
(2) Troubleshooting _____
(3) Corrective Maintenance _____
(4) Equipment alterations _____

1. Completed 3M PQS 301. _____

j. Discuss, in detail, all aspects of electrical safety. _____

k. Discuss, in detail, the objectives and requirements of an electrical safety area. _____

1. Discuss pecifically: identification of boundaries, work package requirements, and test requirements. _____

m. Discuss the procedures followed to raise and lower masts and antennas. _____

		DATE	SIGNATURE
n.	Discuss the mast/fairing inter-relationship.	_____	_____
o.	Discuss the importance of mechanical integrity in electronic systems.	_____	_____
p.	Discuss CASREP procedures.	_____	_____
q.	Discuss Electrostatic Discharge (ESD) precautions.	_____	_____
3.	**Practical Factors**		
a.	Identify the equipment within your division that contain classified components or subassemblies.	_____	_____
b.	Identify the equipment within your division that fall within the SUBSAFE boundary, within “Safety of ship.”	_____	_____
c.	Demonstrate the ability to electrically and hydraulically isolate all equipment in your division.	_____	_____
d.	Demonstrate the ability to raise and lower all mast and antennas (observing mast safety and wash down procedures).	_____	_____
4.	**Examination and Certification**		
a.	Successfully complete a comprehensive written examination prepared by the LCPO and approved by the Navigator. Grade:	_____	_____ LCPO
b.	Examined and recommended for Basic Navigation/ Operations Department Qualifications.	_____	_____ LCPO
c.	Examined and recommended for Qualification.	_____	_____ DIVISION OFFICER
d.	Examined and qualified in Basic Navigation/ Operations Department Qualification.	_____	_____ NAVIGATOR
5.	**Administration**		
a.	Entry made in the Ship's Qualification Notebook.	_____	_____ NAVIGATOR
b.	Entry made in service record (page 4).	_____	_____ PERSONNEL OFFICER

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4302 DUTY NAVIGATION ELECTRONICS TECHNICIAN QUALIFICATION CARD

NAME_____ **RATE**_____

DATE STARTED_____ **DATE DUE**_____

	DATE	NAV LPO
1. **Prerequisites**		
a. Complete the following sections of the ship's qualification:	_____	_____
(1) SSTG, SSMG, and 450 VAC Distribution	_____	_____
(2) Lighting and 120vac Distribution	_____	_____
(3) Masts and Antennas	_____	_____
(4) Ventilation System	_____	_____
b. Completed Basic Navigation/Operations Department Qualification Card.	_____	_____
2. **Required Reading**		
a. CO's Standing Orders applicable to Navigation Watchstanding	_____	_____
b. Navigation Department Organization and Regulations Manual	_____	_____
c. Navigation and Piloting Bill SSM OP 61-17	_____	_____
d. Dutton's Navigation and Piloting, Chapters 5 thru 11	_____	_____
e. COMSUBLANT OPORD 2000 Annex C/COMSUBPAC OPORD 201 Annex C	_____	_____
f. Sail Safety/Sail Tagout Procedures	_____	_____
g. Electrical Safety Procedures	_____	_____
h. Supply procedures concerning material transfer	_____	_____
i. Anchoring Bill	_____	_____
j. Man Overboard Bill	_____	_____
3. **Knowledge Requirements**. Demonstrate a satisfactory knowledge of the following:		
a. Type 18 Periscope	_____	_____
R) b. ESGN/RLGN Navigation System:		
(1) ESGN/RLGN alarms and required actions	_____	_____
(2) Absolute Monitor plot	_____	_____
(3) AN/BSY-1 Interface	_____	_____

c. AN/WSN-2 Gyrocompass _____

d. Location of local area charts and publications _____

e. Signals to be displayed during:

(1) Diving operations _____
(2) Fueling and defueling operations _____
(3) Weapons handling _____
(4) Official visits _____
(5) Dress ship _____

f. How to render honors _____

g. How to execute colors _____

h. How to locate any chart stowed onboard _____

i. Control Room SP phones and MC systems _____

j. Required navigation lights and fog signals, inland/international _____

k. Demonstrate a knowledge of what constitutes a fix and how to layout a DR position and track. _____

l. Maintenance procedures and location of all ship's clocks _____

m. Demonstrate a knowledge of the location, power supply, theory, operating procedures, capabilities, and limitations of the following equipment:

(1) AN/WRN-6 (GPS) _____
(2) AN/BPS-l5 _____
(3) Navigation Lighting Panel _____
(4) Commercial Navigation Equipment _____
(5) CCTV System _____
(6) 35mm Camera/Photo Equipment _____

4. Practical Factors

a. Make proper entries in the following logs:

(1) Ship's Deck Log _____
(2) Bearing Book _____
(3) Ship Position Log _____
(4) Fathometer Log _____
(5) Navigation Workbook _____
(6) ESGN/RLGN Operating Logs _____ (R
(7) Absolute Monitor Plot _____

		DATE	NAV LPO
b.	Operate the following:		
	(1) DDRT	_____	_____
	(2) Navigation Lighting Panel	_____	_____
	(3) Type 18 Periscope	_____	_____
	(4) Underwater Telephone	_____	_____
	(5) Aldis Lamp	_____	_____
	(6) Commercial Navigation Equipment	_____	_____
	(7) AN/WRN-6 (GPS)	_____	_____
c.	Rig the bridge for getting underway	_____	_____
d.	Rig the bridge for dive	_____	_____
e.	Perform a sail tagout	_____	_____
f.	Compute and graph tides and currents	_____	_____
g.	Compute sunrise/sunset/moonrise/moonset	_____	_____
h.	Determine the seniority of a U.S. warship	_____	_____
i.	Attain proficiency on the following piloting party watch station:		
	(1) Navigation Plotter	_____	_____
	(2) Navigation Bearing Recorder	_____	_____
	(3) Navigation Periscope Operator	_____	_____
	(4) Fathometer Operator	_____	_____
	(5) Radar Operator	_____	_____
	(6) Navigation Watch	_____	_____
	(7) Navigation Center Technician	_____	_____
j.	Conduct Divisional Pre-underway Checkoffs	_____	_____
R) k.	Walk-through a shutdown of ESGN/RLGN	_____	_____
l.	Demonstrate the ability to electrically isolate all Navigation Division equipment.	_____	_____

5. **Stand watch under instruction until proficiency is demonstrated**. (Number of watches to be specified by the Assistant Navigator)

DATE	OMOW
_____	_____
_____	_____
_____	_____

_____
ASSISTANT NAVIGATOR

6. **Examination**

a. Pass a written examination approved by the Navigator (including a section on Rules of the Road).

DATE:_____ GRADE:_____ _____
LEADING PETTY OFFICER

b. Pass an oral examination administered by the Leading Petty Officer.

(NOTE: Brief comments on oral examination will be attached)

DATE:_____ GRADE:_____ _____
LEADING PETTY OFFICER

7. **Recommended for qualification**. _____
NAVIGATION DIVISION OFFICER

_____
ASSISTANT NAVIGATOR

8. **Examined and certified as a qualified Duty Navigation Electronics Technician**.

DATE:_____ _____
NAVIGATOR

9. **Administration**

a. Entry made in the Ship's Qualification Notebook. _____ _____
NAVIGATOR

b. Entry made in service record (page 4). _____ _____
PERSONNEL OFFICER

4303 QUARTERMASTER OF THE WATCH QUALIFICATION CARD

NAME_____ **RATE**_____

DATE STARTED_____ **DATE DUE**_____

1. **Prerequisites**	**NAV LPO**
a. Complete Duty Nav ET qualification.	_____
b. Be a qualified helmsman.	_____
c. Complete the following sections of the ship's qualification card. Battery and D.C. Distribution, Lighting, and 60 Hz Distribution, IC Distribution, and Ventilation System.	_____
d. Be a qualified fathometer operator.	_____
e. Be a qualified lookout.	_____

2. Knowledge Requirement. Demonstrate to the satisfaction of the Department Leading Petty Officer a sufficient level of.knowledge of the following:

	DATE	**NAV LPO**
a. Demonstrate knowledge of the Electronic Navigation Equipment including the following:		
(1) Power supplies		
(2) Normal and emergency ventilation		
(3) Functions of major components		
(4) Inter-relations of components		
(5) Information sent to other systems		
b. Demonstrate a knowledge of basic theory, operating procedures, capabilities, and limitations of the following equipment:		
(1) Inertial navigation systems		
(2) Digital and syncro data transmission		
(3) Navigation system degradation under various computer casualty conditions		
(4) LORAN		
(5) Radar		
(6) GPS		
c. Man overboard procedures		
d. Information contained in Sailing Directions, Coast Pilots, and Fleet Guides		
e. The content of the OOD Notebook, operations folder, and operating schedules		

f. IALA A and B Buoyage Systems _____

g. International and Inland Navigation Rules, day signals _____

h. International and Inland Navigation Rules, lights and signals _____

i. International and Inland Navigation Rules, sound signals _____

j. How to select charts for a particular track or area and how corrections are made to charts _____

k. How to determine and apply gyro error _____

1. Procedures following gyro casualty, including the use of a three-arm protractor _____

m. Tactical characteristics _____

n. Red and yellow soundings and how soundings are corrected, recorded, and compared with charted soundings _____

o. The importance of danger bearings _____

p. Course, speed and bearing signal sources, power, and switching arrangements _____

q. Radio and underwater telephone voice procedures _____

r. SINS/DMINS/ESGN/RLGN (SSN); SINS/ESGM(N) (SSBN) outputs and reset requirements _____ (R

s. Navigation/Operations Department Organization and Regulations Manual (NODORM). _____

t. SSORM, SOP/SSM and in particular the following bills with emphasis on duties of QMOW:

(1) Maneuvering Bill _____ _____
(2) Diving Bill _____ _____
(3) Surfacing Bill _____ _____
(4) Ventilation Bill _____ _____
(5) Snorkel Bill _____ _____
(6) General Emergency Bill _____ _____
(7) Anchoring Bill _____
(8) Navigation and Piloting Bill _____
(9) Man Overboard Bill _____ _____
(10) Ship Destruction Bill _____ _____
(11) AGI Surveillance Bill _____ _____
(12) Visitors Bill _____ _____

	DATE	NAV LPO
u. Commanding Officer's Standing Orders	_____	_____
v. Concepts and use of fix expansion as required by the Commanding Officer's Standing Orders, the Navigation Bill, and Article 5105 of this instruction.	_____	_____
w. Proper plotting and evaluation of ship's movement within a moving haven (MHN) including evaluation of submerged interference.	_____	_____
x. Concepts and utilization of bottom contour plotting per U.S. Navy Oceanographic Officer Manual of Procedures for General Bathymetric Navigation (SP 198).	_____	_____
y. COMSUBLANT/COMSUBPAC Lessons Learned (Navigation and Submarine Driving Sections) and COMSUBLANT/ COMSUBPAC Collision and Grounding Brief.	_____	_____

3. **Practical Factors**. Satisfactorily demonstrate the ability to perform the following evolutions:

a. Bearing Recorder	_____	_____
(1) Log bearings and soundings	_____	_____
(2) Make corrections	_____	_____
(3) Convert relative bearings to true bearings	_____	_____
b. Navigation Plotter		
(1) Use of proper scale chart	_____	_____
(2) Lay out a track and annotate with required data	_____	_____
(3) Lay out an anchorage plot	_____	_____
(4) Plot turning bearings and ranges	_____	_____
(5) Plot danger bearings and ranges	_____	_____
(6) Conduct minimum cycle routine and make required reports while in restricted waters.	_____	_____
(7) Plot visual fix using relative bearing and three arm protractor.	_____	_____
c. DDRT/MK 19 Plotter		
(1) Energize and secure	_____	_____
(2) Select and use the proper scale	_____	_____
(3) Setup scale to conform to scale of chart (picked at random), and for man overboard	_____	_____
(4) Maintain a plot involving own ship and at least one target	_____	_____
d. Compute sunrise, sunset, moonrise, and moonset	_____	_____
e. Compute and graph tides and currents	_____	_____

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		DATE	NAV LPQ	
f.	Plot a position using the following information:			
	(1) Visual			
	(2) Radar			
	(3) RDF			
	(4) Bathymetric			
g.	Take and plot LORAN/GPS(All applicable) fixes.			(R
h.	Using light lists, compute geographic and luminous ranges for selected lights.			
i.	Obtain and compute an azimuth of the sun or Polaris to determine gyro error.			
j.	Prepare position reports and make 0800 and 2000 reports to the Commanding Officer.			(R
k.	Demonstrate knowledge, the location, and use of:			
	(1) Navigation lighting panels			
	(2) Sextant			
	(3) Anchor balls			
	(4) Chart portfolios			
	(5) Flare pistol			
1.	Demonstrate how to compute set and drift, using the manual method, SINS/DMINS/ESGN/RLGN/ESGM velocities, and the fire control system analyzer.			(R
m.	Rig the bridge for surface.			
n.	Demonstrate use of the periscopes for telemeter and stadimeter ranging.			
o.	Demonstrate familiarity with use of a periscope.			
P.	Rig the control room for all evolutions in the Compartment Bill Holder.			
q.	Complete Navigation Department Pre-Underway Checkoff			
r.	Conduct a communications check using the underwater telephone and remote radio.			
s.	Use of searchlight and Aldis Lamp, including rigging and stowing.			
t.	Bottom contour navigate using following methods:			
	(1) Sounding strip			
	(2) Advancing sounding lines of position			

	DATE	NAV LPO
u. Plot a running fix; determine an EP	_____	_____
v. Serve as QMOW (under instruction) and perform assigned tasks during the following evolutions:		
(1) Diving	_____	_____
(2) Surfacing	_____	_____
(3) General Emergency	_____	_____
(4) Man Overboard	_____	_____
w. Complete flashing light requirement for QM3	_____	_____

4. **Stand watch under instruction** until proficiency is demonstrated. (Number of watches to be specified by the Assistant Navigator)

DATE	QMOW
_____	_____
_____	_____
_____	_____

_____
ASSISTANT NAVIGATOR

5. **Examination**

a. Pass a written examination approved by the Commanding Officer.

DATE:_____ GRADE:_____ _____
ASSISTANT NAVIGATOR

b. Pass an oral examination administered by the Leading Petty Officer. NOTE: Brief comments on oral examination will be attached)

DATE:_____ _____
LEADING PETTY OFFICER

c. Pass a Rules of the Road examination.

DATE:_____ _____
LEADING PETTY OFFICER

6. **Recommended for qualification as Quartermaster of the Watch**.

DATE:_____ _____
ASSISTANT NAVIGATOR

DATE:_____ _____
LEADING PETTY OFFICER

7. **Examined and recommended for qualification as QMOW**.

DATE:_____ _____
NAVIGATOR

8. **Certified as QMOW**.

_____
COMMANDING OFFICER

9. **Administration**

a. Entry made in the Ship's Qualification Notebook. _____ _____
CO

b. Entry made in service record (page 4). _____ _____
PERSONNEL OFFICER

4304 LOOKOUT QUALIFICATION CARD

NAME_____ **RATE**_____

DATE STARTED_____ **DATE DUE**_____

1. **Knowledge Requirements**. Successfully complete Submarine On Board Training (SOBT) Interactive Courseware (ICW) for Lookout (CBI-N-9509) comprehensive exam (grade:____ LPO initial ____) OR do the following items that can be signed off by Navigator, Assistant Navigator, Navigation Department Leading Petty Officer, or that person(s) designated under the signature line.

		DATE	SIGNATURE
a.	Know how to report a visual contact including relative bearing, position angle, type of contact, angle on the bow, changes in contact course, and attempts to signal.	_____	_____ OOD
b.	Know how to make proper reports while maneuvering, such as "the channel is clear", "screw is backing," etc.	_____	_____ OOD
c.	Recognize and identify ships and commonly encountered aircraft.	_____	_____ OOD
d.	Have an elementary knowledge of Navigation Rules regarding lights on vessels and basic facts about U.S. Uniform System of Buoyage.	_____	_____ OOD
e.	Duties and responsibilities specified in the SSORM/SOP/SSM	_____	_____ OOD/COW

R)

2. **Demonstrate a satisfactory knowledge of the following** (Persons qualified to sign these are Navigator, Assistant Navigator, Navigation Department Leading Petty Officer, or that person(s) designated under the signature line):

a.	Be familiar with all bridge equipment.	_____	_____ OOD/QMOW
b.	Demonstrate ability to use bridge sound powered telephone and MC systems.	_____	_____ OOD/QMOW
c.	Demonstrate proper care and handling of binoculars, foul weather gear, safety harnesses, and safety equipment.	_____	_____ OOD/QMOW
d.	Be familiar with Man Overboard Procedures.	_____	_____ OOD
e.	Demonstrate a knowledge of fog signals.	_____	_____ QMOW
f.	Demonstrate a knowledge of how to conduct a visual search.	_____	_____ OOD

	DATE	SIGNATURE
3. **Read and discuss** selected COMSUBLANT/COMSUBPAC **LeSSOnS** Learned (Submarine Driving Section).		OOD
4. **Practical** Factors		
a. Stand sufficient training watches under instruction to demonstrate proficiency as a lookout.		OOD
b. Rig the bridge for dive.		OOD
c. Rig the bridge for surface.		OOD
5. **Complete a comprehensive oral examiniation** and recommended for qualification as a Lookout.		ANAV
6. **qualified Lookout**		NAVIGATOR
7. **Administration**		
a. Entry made in the Ship's Qualification Notebook.		NAVIGATOR
b. Entry made in service record (page		PERSONNEL OFFICER

(A

4305 ASSISTANT NAVIGATOR QUALIFICATION CARD

NAME _____ **RATE** _____

DATE STARTED _____ DATE DUE _____

1. **Prerecfuisites.** Complete the following:

   a. Piloting/Restricted Water Navigation A-061-0020

   b. Voyage Planning/Open Ocean Navigation A-061-0021

D) c. Quartermaster of the Watch Qualification Card

   d. Navigation Watch Qualification Card (SSN Only)

   e. Qualified Contact Coordinator

_____ _____
DATE NAVIGATOR

2. **Knowledge Requirements.** Demonstrate thorough knowledge of the following:

	DATE	SIGNATURE
R) a. Navigation/Operations Department Organization Manual and the Navigation and Piloting Bill		NAVIGATOR
b. COMSUBLANT/COMSDBPAC Lessons Learned (Submarine Driving and Navigation Sections), CSL/CSP Collision and Grounding Presentation		NAVIGATOR

3. **Practical** Factors

a. Plan a port entry for your submarine into a port, other than home port, selected by your Navigator. This plan must include all charts, tracks, calculation of tides and currents, NAV-AIDS, lights, turning and danger bearings, emergency anchorage, reduced visibility (fog or darkness) considerations, radar navigation, pilotage requirements, available and authorized moorings for nuclear powered ships, and harbor regulations. This plan will be briefed to the ship's Navigator.		ANAV
b. Plan a voyage for your submarine of at least 36 hours duration using a SUBNOTE/MOVORD selected by the Navigator. This plan must include area assignment, MHN considerations, transit depth, all charts and tracks, RED/YELLOW soundings, safety requirements, and action required if out of assigned areas for any reason. This plan will be briefed to the ship's Navigator.		NAVIGATOR

	DATE	SIGNATURE
c. Audit the chart maintenance in effect on your ship. Make a written report of conditions to the Navigator.	_____	_____ NAVIGATOR

4. **Watch Requirements**.

a. Act as Assistant Navigator under instruction for a minimum period of five days at sea. Demonstrate proficiency in practical navigation.	_____	_____ NAVIGATOR
b. Act as Assistant Navigator in a piloting situation and be evaluated by the Executive Officer or the Navigator.	_____	_____ XO/NAVIGATOR

5. **Examination**.

a. Recommended for Qualification as Assistant Navigator.	_____	_____ XO/NAVIGATOR
b. Certified as Assistant Navigator.	_____	_____ CO

6. **Administration**.

a. Entry made in the Ship's Qualification Notebook.	_____	_____ CO
b. Entry made in service record (page 4).	_____	_____ PERSONNEL OFFICER

4306 AN/WLR-1H OPERATOR QUALIFICATION CARD

NAME_____ RATE_____

DATE STARTED_____ DATE DUE_____

		DATE	SIGNATURE
1.	**Prerequisites**		
	a. Completed Basic NAVOPS Department Qualification.	_____	_____ LPO
	b. Completed AN/BRD-7 Operator Qualification	_____	_____ LPO
2.	**Knowledge Requirements**		
	a. Commanding Officer's Standing Orders and requirements contained therein.	_____	_____
	b. MC and phone circuits used in Radio/ESM.	_____	_____
	c. Purpose of the AN/WLR-lH.	_____	_____
	d. Describe the purpose and use of all front panel switches, indicators, and displays	_____	_____
	e. Draw a one-line diagram of RF distribution from antenna to receiver.	_____	_____
	f. Draw a sketch of all ESM antennas. Show location in the sail and frequency coverage.	_____	_____
	g. Discuss various system casualties and operator actions required.	_____	_____
3.	**Practical Factors**		
	a. Electrically isolate the AN/WLR-lH.	_____	_____
	b. Demonstrate the ability to:		
	(1) Perform system turn-on	_____	_____
	(2) Perform BITE Testing	_____	_____
	(3) Perform system setup	_____	_____
	c. Demonstrate the ability to operate the system in the Process Display Mode providing full analysis and classification.	_____	_____
	d. Demonstrate the ability to operate the system in the Automatic Analysis Mode.	_____	_____
	e. Demonstrate the ability to operate the system in the Manual Analysis Mode.	_____	_____

	DATE	SIGNATURE
f. Demonstrate the ability to obtain known bearing information using the following DF modes.	_____	_____
(1) All Signals	_____	_____
(2) IF Signals	_____	_____
(3) Select Signals	_____	_____
g. Demonstrate the ability to output information to the system printer.	_____	_____
h. Demonstrate the ability to secure the system under normal and emergency conditions.	_____	_____
i. Perform the AN/WLR-l(H) pre-underway checks.	_____	_____
j. Prepare a Radar Target Signals List per NWP-77 (REV A).	_____	_____
k. Demonstrate the ability to detect live signals and determine the following parameters:	_____	_____
(1) Frequency	_____	_____
(2) PRF	_____	_____
(3) PW	_____	_____
(4) Scan Time	_____	_____
(5) Scan Type (Video/Audio)	_____	_____
(6) Type of Emission (Visual)	_____	_____
(7) Bearing	_____	_____
(8) Signal Strength	_____	_____
(9) Modulation Types	_____	_____
(10) Radar function	_____	_____
(11) ELINT notations	_____	_____
1. Demonstrate proficiency in making the proper reports to the CONN within specified time.	_____	_____
m. Demonstrate proficiency in the use of and data contained in the following manuals:	_____	_____
(1) NWP 3-13.10.1 Submarine Electronic/Optic Sensor Employment Manual.	_____	_____
(2) NWP 10-1-40 Electronic Warfare Coordination	_____	_____
(3) TACMEMO TM CZ1863-1-84 WLR-lH(V)l OP Guidelines	_____	_____
(4) MCM 3-1 VOL II		
(5) Defense Intelligence "Electronic Order of Battle" (EOB) for the projected mission area	_____	_____
(6) NSA EPL Non-Communist Bloc	_____	_____
(7) NSA EPL Communist Bloc	_____	_____
(8) PER 1	_____	_____
(9) PER 2	_____	_____
(10) FIGSOP	_____	_____

		DATE	SIGNATURE
n.	Demonstrate the ability to determine "Satellite Safe Time" using the SFMPL, Satellite Vulnerability Program.	_____	_____

4. **Training Watches**

Stand three watches under instruction and demonstrated acceptable proficiency as an ESM Watch.	(1)	_____	_____
	(2)	_____	_____
	(3)	_____	_____

5. **Examination and Certification**

a.	Successfully complete a comprehensive written examination prepared by the LCPO and approved by the Navigator. Grade:	_____	_____
b.	Examined and recommended for AN/WLR-lH Operator Qualification.	_____	_____ LCPO
c.	Examined and recommended for AN/WLR-lH Operator Qualification.	_____	_____ DIVISION OFFICER
d.	Examined and certified as a qualified AN/WLR-1H Operator.	_____	_____ NAVIGATOR

6. **Administration**

a.	Entry made in the Ship's Qualification Notebook.	_____	_____ NAVIGATOR
b.	Entry made in service record (page 4).	_____	_____ PERSONNEL OFFICER

4307 AN/WLR-8 OPERATOR QUALIFICATION CARD

NAME_____ RATE_____

DATE STARTED_____ DATE DUE_____

		DATE	SIGNATURE
1.	**Prerequisites**		
a.	Completed Basic Navigation/Operations Department Qualification.	_____	_____ LPO
b.	Completed AN/BRD-7 Operator Qualification.	_____	_____ LPO
2.	**Knowledge Requirements**		
a.	Commanding Officer's Standing Orders and requirements contained therein.	_____	_____
b.	MC and phone circuits used in Radio/ESM.	_____	_____
c.	Purpose of the AN/WLR-8(V).	_____	_____
d.	Demonstrate a detailed knowledge of all equipment locations and power sources.	_____	_____
e.	Draw a one-line diagram of RF distribution from antennas associated with the AN/WLR-6.	_____	_____
f.	Draw a sketch of all ESM antennas. Show location and frequency coverage.	_____	_____
g.	Describe the frequency capabilities of all antennas associated with the AN/WLR-8.	_____	_____
h.	Describe the purpose and use of all switches and indicators located on the periscope E/E adapter, radio room box and ESM Room box that affect the operation of the AN/WLR-8.	_____	_____
i.	Describe the purpose and function of all circuit breakers, switches, display scopes and indicators associated with Units 1, 2, and printer of the AN/WLR-8 system.	_____	_____
j.	Discuss the three modes of operation, their function when each is used and the capabilities.	_____	_____
k.	Describe the indications displayed on the Control Indicator (C-10209) and list the purpose of each.	_____	_____
1.	Discuss casualty modes of operation.	_____	_____

3. **Practical Factors**	**DATE**	**SIGNATURE**
a. Electrically isolate the AN/WLR-8.	_____	_____
b. Demonstrate the ability to:		
(1) Perform system turn-on. Identify the proper auto fault indication.	_____	_____
(2) Load the operational program from magnetic tape, configure, and start the program	_____	_____
(3) Perform System Self-Test and interpret the indication	_____	_____
(4) Perform the Self-Test for all units so equipped.	_____	_____
c. Demonstrate the ability to operate the system in the Scan Lock Mode ensuring proper entries of parameters for full analysis and classification.	_____	_____
d. Demonstrate the ability to operate the system in the Direct Operator Controlled (DOC) Mode, including use of all three sub-modes for full analysis and classification.	_____	_____
e. Demonstrate the ability to operate the system in the system in the Manual Back-up Mode including performance of full analysis and classification. Explain what units this mode bypasses.	_____	_____
f. Demonstrate the ability to operate the system using the library storage capability, including entering, and utilizing stored data.	_____	_____
g. Demonstrate the ability to output information to the printer.	_____	_____
h. Demonstrate the ability to secure the system under normal and emergency conditions.	_____	_____
i. Demonstrate the ability to perform the AN/WLR-8 pre-underway checks.	_____	_____
j. Demonstrate the ability to complete all PMS requirements on the AN/WLR-8 system.	_____	_____
k. Demonstrate the ability to perform audio patching and operate the audio recorder/reproducer.	_____	_____
1. Prepare a Radar Target Signals List per 2-13.10.1.	_____	_____

	DATE	SIGNATURE
m. Demonstrate the ability to detect live signals and determine the following parameters:	_____	_____
(1) Frequency	_____	_____
(2) PRF	_____	_____
(3) PW	_____	_____
(4) Scan time	_____	_____
(5) Scan type (Video/Audio)	_____	_____
(6) Type of emission (Visual)	_____	_____
(7) Bearing (as applicable, using ADF)	_____	_____
(8) Signal strength	_____	_____
(9) Modulation types	_____	_____
(10) Radar function	_____	_____
(11) ELINT notation	_____	_____
n. Demonstrate proficiency in making the proper reports to the CONN within specified times.	_____	_____
o. Demonstrate proficiency in the use of and data contained in the following manuals:	_____	_____
(1) NWP 3-13.10.1 Submarine Electronic/Optic Sensor Employment Manual	_____	_____
(2) NWP 10-1-40 Electronic Warfare Coordination	_____	_____
(3) MCM 3-1 VOL II		
(4) Defense Intelligence "Electronic Order of Battle (EOB)" for the projected mission area.	_____	_____
(5) NSA EPL Non-Communist Bloc	_____	_____
(6) NSA EPL Communist Bloc	_____	_____
(7) PER 1	_____	_____
(8) PER 2	_____	_____
(9) NWP 3.13.10.1(VOL 1) AN/WLR-8(V)2 or NWP 3.13.10.1 (VOL 4) AN/WLR-8(V)5 Operational Guidelines.	_____	_____
(10) FIGSOP	_____	_____
p. Demonstrate the ability to determine "Satellite Safe Time" using the HP 9020 SFMPL, Satellite Vulnerability Program.	_____	_____

4. **Training Watches**

Stand three watches under instruction and demonstrated acceptable proficiency as an ESM watch.	(1)_____	_____
	(2)_____	_____
	(3)_____	_____

5. **Examination and Certification**

a. Successfully complete a comprehensive written examination prepared by the COMM LPO and approved by the Navigator. Grade: _____	_____	_____ LPO

	DATE	SIGNATURE
b. Examined and recommended for AN/WLR-8 Operator Qualification.	_____	_____ LCPO
c. Examined and recommended for AN/WLR-8 Operator Qualification.	_____	_____ DIVISION OFFICER
d. Examined and certified as qualified AN/WLR-8 Operator.	_____	_____ NAVIGATOR

6. **Administration**

a. Entry made in the Ship's Qualification Notebook.	_____	_____ NAVIGATOR
b. Entry made in service record (page 4).	_____	_____ PERSONNEL OFFICER

4308 AN/WLQ-4 OPERATOR QUALIFICATION CARD

NAME_____ RATE_____

DATE STARTED_____ DATE DUE_____

		DATE	SIGNATURE
1.	**Prerequisites**		
a.	Completed Basic Navigation/Operations Department Qualification.	_____	_____
b.	Completed AN/BRD-7 Operator Qualification.	_____	_____
2.	**Knowledge Requirements**		
a.	Commanding Officer's Standing Orders and requirements contained therein.	_____	_____
b.	MC and phone circuits used in Radio/ESM.	_____	_____
c.	Purpose of the AN/WLQ-4.	_____	_____
d.	Demonstrate a detailed knowledge of all equipment locations, power sources, and AFW system.	_____	_____
e.	Draw a one-line diagram of RF distribution from antennas to receiver.	_____	_____
f.	Draw a sketch of all ESM antennas. Show location and frequency coverage.	_____	_____
g.	Describe the purpose and use of all switches and indicators located on the periscope E/E adapter, Radio Room box, and ESM Room box that affect the operation of the AN/WLQ-4.	_____	_____
h.	Describe the purpose and function of all circuit breakers, switches, display scopes, and indicators associated with all operating positions of the AN/WLQ-4 system.	_____	_____
i.	Describe the files and aids for Position 4/5/8 (files listed in DBM, IE: What the file is used for, how to perform a search and sort, file header designation, priority field for additions and delete, and each entry means).		
	(1) AEOB	_____	_____
	(2) AEPL	_____	_____
	(3) ANOB	_____	_____
	(4) ASG2	_____	_____
	(5) EPLF	_____	_____
	(6) ELOG	_____	_____
	(7) ETSL	_____	_____

	DATE	SIGNATURE
(8) EVL4	_____	_____
(9) SYSV	_____	_____
(10) OAEN	_____	_____
(11) OAXT	_____	_____
(12) PMUF	_____	_____
(13) DBMT	_____	_____
(14) ALRM	_____	_____
(15) FLMF	_____	_____
(16) DDXR	_____	_____
(17) DDIR	_____	_____
j. NTDS Symbols used on Pos 5.	_____	_____
k. Pos 4/5/6/8 Fixed Action Buttons (FABS) and Variable Action Buttons (VABS). Minimum knowledge is: VAB obtained by FAB and menu obtained by VAB.		
(1) POS 4	_____	_____
(2) POS 5	_____	_____
(3) POS 6	_____	_____
(4) POS 8	_____	_____
1. Describe various casualties, their effects and the operator's corrective action required.	_____	_____

3. **Practical Factors**

a. Perform system IPL (on both disks).	_____	_____
b. Perform following MMU operations.	_____	_____
(1) Copy	_____	_____
(2) Mount/Dismount	_____	_____
(3) Format	_____	_____
(4) Scrub	_____	_____
c. Make tape to tape copy/file overlay operations.	_____	_____
d. Build a PCS to "task" HPIRs and PAN receivers.	_____	_____
e. Build an event scenario file.	_____	_____
f. Access a file and perform a search and sort on the following parameters:		
(1) Signal parameters (frequency, PRF, PW, and SCAN)	_____	_____
(2) Nickname	_____	_____
(3) ELINT Notation	_____	_____
(4) Platform	_____	_____
g. Perform "Data Base Maintenance" (add, change, and delete).	_____	_____

		DATE	SIGNATURE
h.	Demonstrate the ability to operate the following signal detection modes (Pos 4/8).	_____	_____
	(1) Acquisition Queue	_____	_____
	(2) Processing Queue	_____	_____
	(3) Pans	_____	_____
i.	Demonstrate the ability to move detected signals from Pans and Acquisition Queue to the Processing Queue.	_____	_____
j.	Demonstrate the ability to perform the following DF Measurements:		
	(1) AN/WLR-6 DF Analog (DFAD)	_____	_____
	(2) RDF/ADF functions	_____	_____
	(3) AN/WLQ-4 DF PPI	_____	_____
k.	Make an intercept Log entry from Pos 4/8	_____	_____
1.	Plot a “MIAC”	_____	_____
m.	Plot intercepted signals	_____	_____
n.	Set the Time Code Generator	_____	_____
o.	Change paper in the printer and clean the printer head.	_____	_____
p.	Perform a normal start up and shutdown (walk-through if in use or shutdown for maintenance).	_____	_____
q.	Prepare a Radar Target Signals List per NWP-3-13.10.1.	_____	_____
r.	Demonstrate the ability to detect live signals and determine the following parameters:		
	(1) PW (using Pos 4 o'scope)	_____	_____
	(2) Scan Time	_____	_____
	(3) Scan type (Video/Audio)	_____	_____
	(4) Type of emission (Visual)	_____	_____
	(5) Signal strength (Audio)	_____	_____
	(6) Modulation types	_____	_____
	(7) Radar function	_____	_____
s.	Demonstrate proficiency in making the proper reports to the CONN within specified times.	_____	_____

	DATE	SIGNATURE
t. Demonstrate proficiency in the use of and data contained in the following manuals:		
(1) NWP 3-13.10.1 Submarine Electronic/optic Sensor Employment Manual	_____	_____
(2) NWP 10-1-40 Electronic Warfare Coordination	_____	_____
(3) MCM 3-1 VOL II	_____	_____
(4) NWP 3-13.10.1(VOL 3) Operating Guidelines	_____	_____
(5) Defense Intelligence "Electronic Order of Battle" (EOB) for the projected mission area	_____	_____
(6) NSA EPL Non-Communist Bloc	_____	_____
(7) NSA EPL Communist Bloc	_____	_____
(8) PER 1	_____	_____
(9) PER 2	_____	_____
(10) FIGSOP	_____	_____
u. Demonstrate the ability to determine “Satellite Safe Time" using the SFMPL, Satellite Vulnerability Program.	_____	_____

4. **Training Watches**

Stand three watches under instruction and demonstrated acceptable proficiency as an ESM Watch.	(l)_____	_____
	(2)_____	_____
	(3)_____	_____

5. **Examination and Certification**

a. Successfully complete a comprehensive written examination prepared by the COMM LCPO and approved by the Navigator. Grade:_____	_____	_____ LCPO
b. Examined and recommended for AN/WLQ-4 Operator Qualification.	_____	_____ LCPO
c. Examined and recommended for AN/WLQ-4 Operator Qualification.	_____	_____ DIVISION OFFICER
d. Examined and certified as a qualified AN/WLQ-4 Operator.	_____	_____ NAVIGATOR

6. **Administration**

a. Entry made in the Ship's Qualification Notebook.	_____	_____ NAVIGATOR
b. Entry made in service record (page 4).	_____	_____ PERSONNEL OFFICER

4309 RADAR/IFF OPERATOR QUALIFICATION CARD

NAME_____ RATE_____

DATE STARTED_____ DATE DUE_____

		DATE	SIGNATURE
1.	**Prerequisites**		
	a. Completed Basic Navigation/Operations Department Qualification.	_____	_____
2.	**Knowledge Requirements**		
	a. Commanding Officer's Standing Orders and requirements contained therein.	_____	_____
	b. MC and phone circuits associated with radar operations.	_____	_____
	c. Purpose of the radar.	_____	_____
	d. Draw a one line diagram of RF/power distribution from antenna to receiver/transmitter noting location all each item.	_____	_____
	e. Describe the purpose and function all switches, indicators, and display scopes associated with the radar.	_____	_____
	f. Discuss various casualty situations and operator actions required.	_____	_____
	g. Discuss the procedures to be followed during the relief of the watch.	_____	_____
	h. Read and discuss the contents of the following publications:		
	(1) Radar Watchstanding Procedure	_____	_____
	(2) Maneuvering Board Manual Publication 1210	_____	_____
	(3) Radar Navigation Pub 1310	_____	_____
	(4) Reduced Visibility Bill	_____	_____
	(5) Navigation and Piloting Bill	_____	_____
	(6) Navigation Rules 1 thru 19	_____	_____
	(7) Navigation Department Organization and Regulation Manual (NODORM)	_____	_____
	i. Be able to draw, from memory, the following:		
	(1) Radar system block diagram	_____	_____
	(2) Radar system electro-hydraulic system	_____	_____
	(3) IFF system block diagram	_____	_____
	j. Demonstrate detailed knowledge of the radar system.	_____	_____

		DATE	SIGNATURE
k.	Demonstrate detailed knowledge of the AN/SPA-25.	_____	_____
1.	Demonstrate detailed knowledge of the AN/APX-72.	_____	_____
m.	Demonstrate detailed knowledge of radar display Fisher Plot procedures.	_____	_____
n.	Demonstrate detailed knowledge of the selection and assignment of landmarks when piloting.	_____	_____
o.	Discuss the significance of a zero-bearing rate situation.	_____	_____
p.	Demonstrate detailed knowledge of radar plotting techniques.	_____	_____
q.	Demonstrate detailed knowledge of bearing/range recording procedures.	_____	_____
r.	Demonstrate a through understanding of how fixes are obtained when the radar is used for navigation.	_____	_____
s.	Describe how the radar is used simultaneously for navigation and contact avoidance. Include logkeeping and communications procedures.	_____	_____
t.	Demonstrate detailed knowledge of required reports to the Navigator during piloting situations.	_____	_____
u.	Demonstrate detailed knowledge of the following radar principles:		
	(1) Ringtime	_____	_____
	(2) Elements of relative motion	_____	_____
	(3) Relative motion plotting	_____	_____
	(4) Radar plotting symbols	_____	_____
	(5) True speed, heading and CPA	_____	_____
v.	Demonstrate a satisfactory knowledge of and the ability to use the three minute rule.	_____	_____
w.	Demonstrate a detailed knowledge of the MK XII IFF code system.	_____	_____
x.	CSL/CSP Lessons Learned (Navigation Section) and CSL/CSP Collision Presentation.	_____	_____

3. **Practical Factors**

a.	Demonstrate the ability to energize and tune the radar.	_____	_____

	DATE	SIGNATURE
b. Demonstrate the ability to properly raise, rotate, radiate, secure, lower, and hydraulically isolate the radar.	_____	_____
c. Demonstrate the ability to properly operate the radar in all modes.	_____	_____
d. Demonstrate the ability to determine a contacts relative motion and CPA.	_____	_____
e. Demonstrate the ability to obtain a satisfactory radar navigation fix.	_____	_____
f. Demonstrate the ability to properly report radar contacts.	_____	_____
g. Demonstrate the ability to set-up and maintain all radar logs.	_____	_____
h. Demonstrate the ability to properly set the codes for all modes of the AN/APX-72 IFF Set.	_____	_____
i. Using the maneuvering board, demonstrate the ability to determine:		
(1) Contact course	_____	_____
(2) Contact speed	_____	_____
(3) CPA bearing, range and time	_____	_____
(4) Direction and speed of relative motion	_____	_____
(5) Own ship's maneuver to open/close CPA to a specified range.	_____	_____
j. Properly set up the TSEC/KIT-lA/C and demonstrate use of the peacetime MARK XII MODE 3/A safe passage procedures.	_____	_____

4. **Training Watches**

a. Stand Watches under instruction and demonstrated proficiency in the following operations:		
(1) At least two (2) hours on the radar set while piloting in restricted waters.	_____	_____
(2) At least one (1) hour as secondary plotter while piloting in restricted waters.	_____	_____

5. **Examination and Certification**

a. Successfully complete a comprehensive written examination prepared by the NAV LPO and approved by the Navigator. Grade:_____	_____	_____ LPO

	DATE	SIGNATURE
b. Examined and recommended for Radar/IFF Operator Qualification.	_____	_____ LCPO
c. Examined and recommended for Radar/IFF Operator Qualification.	_____	_____ DIVISION OFFICER
d. Examined and certified as a qualified Radar/IFF Operator.	_____	_____ NAVIGATOR

6. **Administration**

a. Entry made in the Ship's Qualification Notebook.	_____	_____ NAVIGATOR
b. Entry made in service record (page 4).	_____	_____ PERSONNEL OFFICER

4310 AN/BRD-7 OPERATOR QUALIFICATION CARD

NAME_____ RATE_____

DATE STARTED_____ DATE DUE_____

		DATE	SIGNATURE
1.	**Prerequisites**		
	a. Completed Basic NAVOPS Department Qualification.	_____	_____
2.	**Knowledge Requirements**		
	a. Commanding Officer's Standing Orders and requirements contained therein.	_____	_____
	b. MC and phone circuits associated with radar operations.	_____	_____
	c. Purpose of the AN/BRD-7.	_____	_____
	d. Describe the purpose and use of all front panel switches, indicators, and displays.	_____	_____
	e. Draw a one line diagram of RF distribution from antennas to receiver.	_____	_____
	f. Discuss various casualty modes of operation.	_____	_____
	g. Have a detailed knowledge of the following operations and features of the AN/BRD-7 system including:	_____	_____
	(1) Frequency range of the following:		
	(a) LF/MF	_____	_____
	(b) HF	_____	_____
	(c) VHF-I	_____	_____
	(d) VHF-2	_____	_____
	(e) VHF-3	_____	_____
	(f) Low Band DF	_____	_____
	(g) High Band DF	_____	_____
	(2) Operating Controls and Indicators:		
	(a) Local Unit 2AI	_____	_____
	(b) Printer Assembly 2A2	_____	_____
	(c) Assembly 2A4	_____	_____
	(d) Remote unit 3A2	_____	_____
	(e) Assembly 3A6	_____	_____
	h. Demonstrate a knowledge of the Mast/Scope indicator and the mast override switch.	_____	_____

	DATE	SIGNATURE
i. Demonstrate working knowledge of the CRT PAN displays.	_____	_____
j. Demonstrate a working knowledge of the following modes of operation:		
(1) Operation	_____	_____
(2) Quick Look	_____	_____
(3) Internal Test	_____	_____
(4) External Test	_____	_____
(5) Situation	_____	_____
k. Describe the DF print out.	_____	_____

3. **Practical Factors**

a. Complete an operations intercept log using information from the AN/BRD-7.	_____	_____
b. Raise and lower the AN/BRD-7 mast.	_____	_____
c. Perform system turn-on procedure.	_____	_____
d. Demonstrate the ability to insert all instructions.	_____	_____
e. Demonstrate the ability to program for automatic DF operation.	_____	_____
f. Demonstrate the ability to manually assign a receiver and obtain a DF on signals in LF/MF, HF, VHF-1, VHF-2 and VHF-3.	_____	_____
g. Demonstrate the ability to eliminate interfering signals.	_____	_____
h. Demonstrate a working knowledge of a threat signal.	_____	_____
i. Demonstrate the ability to search for and analyze signals in all frequency bands and report the results to the CONN in the specified times.	_____	_____
j. Using a bearing correction chart; DF and correct a signal of interest.	_____	_____
k. Prepare a Communications Target Signal List per NWP 3-13.10.1.	_____	_____
1. Demonstrate proficiency in the use of and data contained in the following manuals:	_____	_____
(1) NWP 3-13.10.1 Submarine Electronic/Optic Sensor Employment Manual.	_____	_____

	DATE	SIGNATURE
(2) NWP 10-1-40 Electronic Warfare Coordination	_____	_____
(3) NWP 3-55.412 (REV A) AN/BRD-7 Operating Guidelines.	_____	_____
(4) MCM 3-1 VOL 11	_____	_____
(5) Defense Intelligence "Electronic Order of Battle" (EOB) for the projected mission area.	_____	_____
(6) NSA EPL Non-Communist Bloc	_____	_____
(7) NSA EPL Communist Bloc	_____	_____
(8) FIGSOP	_____	_____
m. Demonstrate a working knowledge of the SFMPL "Cactus" Program.	_____	_____

4. **Training Watches**

Stand three watches under instruction and demonstrate acceptable proficiency as an AN/BRD-7 0perator.	(1)	_____	_____
	(2)	_____	_____
	(3)	_____	_____

5. **Examination and Certification**

a. Successfully complete a comprehensive written examination prepared by the COMM LPO and approved by the Navigator. Grade:_____	_____	_____ LPO
b. Examined and recommended for AN/BRD-7 Operator Qualification.	_____	_____ LCPO
c. Examined and recommended for AN/BRD-7 Operator Qualification.	_____	_____ DIVISION OFFICER
d. Examined and certified as a qualified AN/BRD-7 Operator.	_____	_____ NAVIGATOR

6. **Administration**

a. Entry made in the Ship's Qualification Notebook.	_____	_____ NAVIGATOR
b. Entry made in service record (page 4).	_____	_____ PERSONNEL OFFICER

4311 RADIOMAN OF THE WATCH/DUTY RADIOMAN QUALIFICATION CARD

NAME_____ RATE_____

DATE STARTED_____ DATE DUE_____

*Indicates Duty Radioman requirements.

			DATE	SIGNATURE
1.		**Prerequisites**		
*	a.	Completed Basic Navigation/Operations Department Qualification.	_____	_____ LPO
	b.	Completed Duty Radioman qualification (For RMOW Qualification)	_____	_____ LPO
2.		**Knowledge Requirements**		
*	a.	Commanding Officer's Standing Orders and requirements contained therein.	_____	_____
*	b.	MC and phone circuits associated with radio operations.	_____	_____
*	c.	Demonstrate a thorough understanding of the applicable communications publications, operations plans, and orders.	_____	_____
*	d.	Demonstrate a knowledge of distress communication, frequencies, and procedures governing their use.	_____	_____
*	e.	Demonstrate a thorough knowledge of UNIDENT (UNCLE JOE) communications procedures.	_____	_____
*	f.	Demonstrate a thorough knowledge of Nuclear Accident/Incident communications procedures.	_____	_____
	g.	Operational and Time Criteria Reporting of the following:		
*		(1) OPREP-3	_____	_____
*		(2) UNIT SITREP	_____	_____
*		(3) SITREP	_____	_____
*		(4) BEARD IRON	_____	_____
*		(5) EAM'S	_____	_____
*		(6) LOGREQ Messages	_____	_____
*	h.	Handling, safeguarding, and inventory requirements associated with CMS material.	_____	_____ CMS CUSTODIAN/ ALTERNATE

			DATE	SIGNATURE
*	i.	Use and employment of circuit MAYFLOWER, Officer in Tactical Command Information Exchange System (OTCIXS), and Tactical Data Information Exchange Subsystem (TADIXS-A).	_____	_____
*	j.	JTIDS/LINK-11.	_____	_____
	k.	Demonstrate a thorough knowledge of the following antennas and antenna associated equipment (including their functions, capability, and limitation):		
*		(1) TN-439/BRA-6 tuner/RF-91	_____	_____
*		(2) AN/BRA-24/CU-2270	_____	_____
*		(3) AN/BRA-34/CU-2364	_____	_____
*		(4) AS-3434(V)/AS-2629	_____	_____
*		(5) AT-441	_____	_____
*		(6) AT-774	_____	_____
*		(7) TS-3858	_____	_____
*		(8) Type 18 Periscope Antennas in Radio/Unit 18	_____	_____
	l.	Demonstrate a thorough knowledge of the following receivers and receiver associated equipment including their functions, capabilities, and limitations:		
*		(1) R-2368G	_____	_____
*		(2) AN/WRR-3	_____	_____
*		(3) R-1051	_____	_____
*		(4) MD-1054/USQ-76	_____	_____
*		(5) C-10863/USQ-76	_____	_____
*		(6) J-3780/UYK	_____	_____
*		(7) 0-1695/U / 0-1824/U	_____	_____
*		(8) AM-2123	_____	_____
*		(9) WRR-7 AND/OR WM-7B	_____	_____
	m.	Demonstrate a thorough knowledge of the following transmitters/transceivers/receivers and associated equipment including their source of power/power supplies, function, capabilities, and limitations:		
*		(1) AN/WRR-3	_____	_____
*		(2) AN/WSC-3	_____	_____
*		(3) AN/URT-23	_____	_____
*		(4) AN/UGC-136	_____	_____
*		(5) TT-603	_____	_____
*		(6) TT-605	_____	_____
*		(7) C-7595	_____	_____
*		(8) SB-3890, SB-3916, SB-3917, SB-3918, SB-3959, SB-4124, SA-734, SA-1712, SA-1956, SA-9413	_____	_____
		(9) R-2368G	_____	_____
		(10) Submarine Message Buffer (SMB)	_____	_____
		(11) Generic Front-End Communications Processor (GFCP II)	_____	_____

			DATE	SIGNATURE
*	n.	Read all applicable KAOs and demonstrate a thorough knowledge of the following crypto equipment and auxiliary equipment:		
*		(1) TSEC/KG-84A (KAO 184)	_____	_____
*		(2) TSEC/KG-84C (KAO 210)	_____	_____
*		(3) TSEC/KW-46 (KAO 207)	_____	_____
*		(4) TSEC/KY-58 (KAO 168)	_____	_____
*		(5) TSEC/KG-38 (KAO 137)	_____	_____
*		(6) TSEC/KG-40A(KGX-40)	_____	_____
*		(7) TSEC/KL-51 (KAO 196)	_____	_____
*		(8) ANDVT/KYV-5		
	o.	Demonstrate a thorough knowledge of the following portable and emergency radio equipment functions, limitations, and capabilities:		
		(1) AN/BRM-2 & AN/BRT-1	_____	_____
*		(2) T-616( )/SRT	_____	_____
*		(3) AN/CRT-3	_____	_____
*		(4) AN/PRC-96	_____	_____
*		(5) RAYTHEON VHF-FM Radiotelephone	_____	_____
*		(6) AN/BRT-6	_____	_____
	p.	Demonstrate a thorough knowledge of the following converter and associated equipment:		
*		(1) CV-483D AN/URA-17	_____	_____
*		(2) CV-2460	_____	_____
	q.	Demonstrate a thorough knowledge of the following miscellaneous equipment:		
		(1) SG-1065/US & ID-1960/US	_____	_____
		(2) USM-296	_____	_____
*		(3) RAPP/(SPP-N-40516)	_____	_____
	r.	Demonstrate a thorough knowledge of the system external to Radio utilizing Radio’s antennas and frequency systems:		
		(1) AN/BRN-7 (OMEGA)	_____	_____
*		(2) AN/APX-72	_____	_____
	s.	Demonstrate proficiency in the use of and data contained in the following manuals:		

DATE **SIGNATURE**

(1) CINCPACFLT OPORD 201 ANNEX K/CINCLANTFLT OPORD 2000 ANNEX K
(2) COMSUBPAC OPORD 201/COMSUBLANT OPORD 2000
* (3) EFFECTIVE FLEET OPORD ANNEX K THAT SHIP CAN BE ASSIGNED TO (EG. 2nd, 3rd, 6th, 7th).
(4) COMSUBPAC CEI
* (5) NTP-4
* (6) NTP-3
(7) NTP-2
(8) CMS-1
(9) OPNAV 5510.1
(10) NWP-4
(11) OPNAVINST 4790.4 (3-M MANUAL)
(12) NWP-0
(13) NWP-10-1-10
(14) FTP PAC/IO(SUBPAC); FTP LANT/MED(SUBLANT)
(15) COMNAVCOMTELCOMINST S2007 SERIES

I have read and understood the data contained in the above manuals.

_____ _____
MEMBER DATE

t. Demonstrate a thorough understanding of the following:

* (1) Radio standard operating procedures _____ _____
* (2) Proper handling of Special Handling messages (AMCROSS, CO EYES ONLY, ETC.) _____ _____
* (3) Proper reports to the OOD _____ _____

u. CSL/CSP Lessons Learned(Classified Material Section)_____ _____

3. **Practical Factors**

* a. Properly use authentication procedures associated with call up, challenge, reply, and transmission authentication system. _____ _____

* b. Properly use recognition and identification codes (USN). _____ _____

* c. Properly use the Daily Changing Call Sign system and encrypt/decrypt call signs for a 10 day period._____ _____

* d. Draft, type, and route all types of naval messages. _____ _____

* e. Properly use the NATO Naval Numeral Code (NUCO) (SUBLANT ONLY). _____ _____

* f. Properly use the NATO Naval and Maritime Air tactical code and the NATO Sub-Air Code (SUBLANT ONLY). _____ _____

			DATE	SIGNATURE
*	g.	Properly use the U.S. Navy Operations Code (NAVOP CODE).	_____	_____
	h.	Demonstrate proper procedure for encrypting/ decrypting an off-line message.	_____	_____
*	i.	Complete a Communications Division Pre-Underway checkoff list.	_____	_____
*	j.	Stand a watch on the following circuits, and demonstrate the ability to line-up each system:		
		(1) Submarine Broadcasts:		
		* (a) VERDIN	_____	_____
		* (b) FSK (VALLOR)	_____	_____
		* (c) SSIXS	_____	_____
		(d) Double encrypted VERDIN	_____	_____
		(2) Radiotelephone Circuits:		
		(a) Clear HF	_____	_____
		* (b) Secure UHF (VINSON)	_____	_____
		* (c) Clear UHF	_____	_____
		* (d) Secure HF (ANDVT)	_____	_____
		* (e) SATHICOM	_____	_____
		(3) SHIP/SHORE Circuits:		
		* (a) SIMPLEX UHF	_____	_____
		* (b) Semi-duplex HF	_____	_____
		* (c) SATCOM LDR	_____	_____
		(4) Data Link Communication System:		
		* (a) STDL/LINK 11	_____	_____
		(b) SODL/OTCIXS	_____	_____
		(c) TADIX-A	_____	_____
		(5) DAMA Operations		
		(a) DAMA SATHICOM	_____	_____
		(b) TADIXS		
		(c) DAMA PRISS		
	k.	Properly rig and load both emergency whip antennas.	_____	_____
	1.	Stream and retrieve the floating wire antenna.	_____	_____
	m.	Demonstrate the ability to maintain the following logs and files:		
*		(1) Radio log	_____	_____

		DATE	SIGNATURE
*	(2) Watch-to-watch inventory	_____	_____
*	(3) Circuit log	_____	_____
*	(4) SECRET/TOP SECRET message log/files	_____	_____
*	(5) Broadcast Log/File	_____	_____
*	(6) PSCIB's/CIBS	_____	_____
*	(7) Radio Visitors Log	_____	_____
	(8) General Message Files	_____	_____
*	(9) Communications Center Master File	_____	_____
	n. Demonstrate the ability to use the ship's communications plan.	_____	_____

4. **Training Watches**

*	Stand three watches under instruction and demonstrate acceptable proficiency as a Radioman of the Watch.	(1)_____	_____
		(2)_____	_____
		(3)_____	_____

5. **Examination and Certification**

*	a. Successfully complete a comprehensive written examination prepared by the Senior Communicator and approved by the Navigator. Grade:_____	_____	_____ SR COMM
*	b. Examined and recommended for RMOW/Duty RM Qualification.	_____	_____ SR COMM
*	c. Examined and recommended for RMOW/Duty RM Qualification.	_____	_____ DIVISION OFFICER
*	d. Examined and certified as a qualified Radioman of the Watch/Duty RM.	_____	_____ NAVIGATOR

6. **Administration**

	a. Entry made in the Ship's Qualification Notebook.	_____	_____ NAVIGATOR
	b. Entry made in service record (page 4).	_____	_____ PERSONNEL OFFICER

USS_____NAVOPSDEPTINST 5400.___

4312 AUXILIARY ELECTRICIAN FORWARD QUALIFICATION CARD

NAME_____ RATE_____

DATE STARTED_____ DATE DUE_____

1. **Prerequisites**	**DATE**	**SIGNATURE**
a. Qualified Phone Talker	_____	_____

2. **Theoretical Knowledge Factors**. Demonstrate a thorough knowledge of the following:

	DATE	**QPO**
a. DC distribution	_____	_____
b. 60 Hz distribution	_____	_____
c. 400 Hz distribution	_____	_____
d. Navigation and topside light	_____	_____
e. IC switchboards	_____	_____
f. Central atmosphere monitoring system	_____	_____
g. Portable Atmosphere Monitioring Equipment	_____	_____
h. Hydrogen detectors	_____	_____
i. MC systems and alarms	_____	_____
j. Sound powered phones	_____	_____
k. Shore phones	_____	_____
1. Ballast control panel	_____	_____
m. Ships control panel	_____	_____
n. Gyro and associated systems	_____	_____
o. Underwater log	_____	_____
p. Snorkel safety circuits	_____	_____
q. Mast operating and position indicator	_____	_____
r. Depth detecting system	_____	_____
s. Tank level indicating system	_____	_____
t. Valve position indicating system	_____	_____

		DATE	QPO
	u. Hydraulics control and indication	_____	_____
	v. Ventilation system and precipitators	_____	_____
	w. NODORM (duties and responsible of the Auxiliary Electrician Forward)	_____	_____
	x. Ships tagout procedures	_____	_____

3. **Practical Factors**. Perform or simulate and demonstrate through discussion a thorough knowledge of the following operations (* indicates actual performance required).

*	a. Locate and demonstrate the proper use of all damage control equipment.	_____	_____
*	b. Lineup IC switchboards for underway and in port	_____	_____
	c. Lineup and test all MC and alarm circuits	_____	_____
*	d. Start and secure the MK 19 gyro	_____	_____
	e. Lineup the forward SP phone matrix for:		
*	(1) normal underway	_____	_____
*	(2) maneuvering watch	_____	_____
*	(3) reduced visibility	_____	_____
*	(4) battle stations	_____	_____
*	f. Operate and calibrate the atmosphere analyzer.	_____	_____
*	g. Perform a Navigation division pre-underway checkoff.	_____	_____
	h. Demonstrate the ability to rig the forward compartment per the following:		
*	(1) Rig for dive bill	_____	_____
*	(2) Rig for surface bill	_____	_____
*	(3) General emergency bill	_____	_____
*	(4) Reduced electrical bill	_____	_____
	Perform the following as Auxiliary Electrician Forward:		
*	(1) Dive	_____	_____
*	(2) Surface	_____	_____
*	(3) Snorkel	_____	_____
*	(4) Ventilate	_____	_____
*	(5) Rig for deep submergence	_____	_____
*	i. Stand one (1) watch as BCP Operator under the supervision of the Chief of the Watch	_____ COW	_____

			DATE	QPO
*	j.	Stand a minimum of four (4) watches under instruction as Auxiliary Electrician Forward	1._____ 2._____ 3._____ 4._____	_____ _____ _____ _____

4. **Casualties**.

a. For the following casualties, discuss and demonstrate a thorough knowledge of the actions required.

(1) Fire	_____	_____
(2) Flooding/collision	_____	_____
(3) Weapons emergency	_____	_____
(4) Emergency deep	_____	_____
(5) Toxic gas	_____	_____
(6) Reduced electrical	_____	_____
(7) Loss of 60 Hz power	_____	_____
(8) Loss of 400 Hz power	_____	_____

b. Actually perform the following listed casualties.

(1) Fire	_____	_____
(2) Reduced electrical	_____	_____

5. **Examination**.

a. Satisfactorily complete a comprehensive oral examination on the above subjects administered by the Navigation Division Leading Petty Officer.

DATE:_____ _____
NAVIGATION DIVISION LEADING
PETTY OFFICER

b. Satisfactorily complete a comprehensive written examination on the above subjects administered by the Navigator.

DATE:_____ _____ _____
GRADE NAVIGATOR

c. Satisfactorily complete a comprehensive oral examination on the above subjects administered by the Engineer.

DATE:_____ _____
ENGINEER

d. Satisfactorily complete a comprehensive oral examination on the above subjects administered by the Navigator. Qualified Auxiliary Electrician Forward.

DATE:_____ _____
NAVIGATOR

6. **Administration**

a. Entry made in the Ship's Qualification Notebook.	_____	_____ NAVIGATOR
b. Entry made in service record (page 4).	_____	_____ PERSONNEL OFFICER

USS_____NAVOPSDEPTINST 5400.

4313 NAVIGATION WATCH QUALIFICATION CARD

(A

NAME_____ RATE_____

DATE STARTED_____ DATE DUE_____

1. **Prerequisites**	**DATE**	**NAV LPO**
a. Completed **Basic** Navigation/Operations Department Qualification Card.		
b. Complete the following sections of the ship's qualification card: Battery and DC Distribution, Lighting and 60 HZ Distribution, 400 HZ Distribution, IC Distribution, and Ventilation System.		
c. Qualify Radar/IFF Operator.		

2. Reuuired Knowledge. Demonstrate a thorough knowledge of the following:

a. Demonstrate a knowledge of the Electronic Navigation Equipment including the following:		
(1) Power supplies		
(2) Normal and emergency ventilation		
(3) Functions of major components		
(4) Interrelations of components		
(5) Information sent to other systems		
b. Basic theory, operating procedures, capabilities, and limitations of the following equipment: (as applicable)		
(1) SINS/DMINS/ESGN/RLGN (include degrades under various computer casualties)		
(2) LORAN c		
(3) Digital and syncro data transmission		
(4) Radar		
(5) Fathometer		
(6) E&Log (include calibration)		
(7)		
c. Integrated ship's navigation including basic navigation principles and theory, and the relative accuracy of various fixes		NAV/ANAV
d. Location, content, and use of all instructions, publications, logs, and records maintained by the Navigation Watch		NAV LPO

3. Practical Factors. Satisfactorily demonstrate the ability to perform the following evolutions: (as applicable)

	DATE	NAV LPO
a. SINS/DMINS/ESGN/RLGN		
(1) Start up and shutdown(Perform/Walkthrough).		
(2) Shift SINS/DMINS/ESGN/RLGN power supplies.		
(3) Evaluate and enter a dockside reset.		
(4) Evaluate and enter an at-sea reset.		
(5) Maintain monitor plots.		
b. Operate LORAN C.		
c. Obtain a GPS fix.		
d. Use SINS/DMINS/ESGN/RLGN and EM log to compute set and drift.		
e. Demonstrate ability to maintain navigation, geographic, CEP, and time/bearing plots.		

4. Stand watch under instruction.

a. Stand watch under instruction until proficiency is demonstrated. (Number of watches to be specified by the Navigation Division Leading Petty Officer.)

DATE	NAVIGATION WATCH

5. Examination

a. Pass a written examination approved by the Navigator.

DATE: _____ GRADE: _____ NAV LPO: _____

b. Pass an oral examination administered by the Navigation Division Leading Petty Officer and recommended for qualification as Navigation Watch.

DATE: _____ NAV LPO: _____

c. Examined and certified as Navigation Watch.

DATE: _____ NAVIGATOR: _____

6. Administration

a. Entry Made in ship's watch qualification book.

DATE: _____ NAV LPO: _____

b. Entry made in individual service record.

DATE: _____ PERS OFF: _____

CHAPTER V

OPERATING PROCEDURES AND SAFETY PRECAUTIONS

5100 GENERAL

1. This chapter shall be used as a guide to the Navigator, Officer of the Deck (OOD), Quartermaster of the Watch (QMOW) and other members of the navigation team in the performance of their respective duties. It provides a set of minimum standards and procedures for the practice of navigation. It is directive in nature and intent and any failure or inability to conform with its provisions shall be reported promptly to the Navigator.

2. By design, this chapter compliments the Navigation and Piloting Bill. Commanding Officer's Standing Orders ***may*** be promulgated ***to*** provide ship specific navigation information which compliments the Navigation and Piloting Bill and this chapter. The Navigator, OODs and QMs shall review this chapter quarterly in conjunction with their review of the standing orders. Any conflict between this chapter and higher authority shall be brought to the Commanding Officer's attention via the Navigator.

5101 POLICY. When at sea and particularly when approaching land and or shoal waters, the OOD shall keep himself continuously informed of the tactical situation and geographic factors which may affect the safe navigation of the ship and take appropriate action to avoid the danger of grounding. In fulfilling these responsibilities from reference (a), the OOD, the QMOW, and other watchstanders responsible to the OOD shall be guided by the principles and procedures presented in this chapter. They should never hesitate to

station or recommend stationing the full maneuvering watch piloting party or to request assistance of additional navigation personnel. It must be emphasized, however, that no set of procedures can suffice in lieu of prudent skepticism, watchstander diligence, and conservative good judgment.

5102 VOYAGE PREPARATIONS

1. Careful preparation portends a safe and efficient voyage. This chapter provides a series of instructions, procedures, and checkoff lists to aid the Navigator and Commanding Officer in logically directing and ensuring the accomplishment of all necessary steps to achieve this goal.

2. The basic steps to ensure proper preparation are:

a. Ensure that the correct charts are selected for the intended operations, and that charts to be used are corrected up to date. Use of the "NAVINFONET" system *run* by the Defense Mapping Agency to assist in this process is encouraged.

b. Establish the overall track and opeations plan.

c. Prepare in detail the navigational and operational plans for those portions of the voyage outside of restricted waters except for strategic patrols which will be prepared not more than one week in advance. Some ships may desire to plan these voyages on chart overlays in lieu of the charts themselves. This practice has lead to serious navigation errors including grounding when the overlays were not essentially transparent. Use of tracing paper overlays, such as that typically used on the geo plot is strongly discouraged. Chart overlays used in navigation must be reviewed and approved
A) in the same manner as the chart in use. This review will be annotated on the overlay.

d. Prepare in detail the navigational track and supporting information required for operation in restricted waters, for departing from port, operating within restricted waters during the operation (if applicable), and arriving in the next port.

e. Thoroughly brief the appropriate members of the ship's navigation and operational teams on each of the phases of the transit.

f. Verify the proper operation of navigational equipment and completion of the appropriate preparations prior to their use or need.

LT. Verify the overall track is within the achievability arcs and deconflicted areas per appropriate strategic publications. (SSBN's only).

3. The checkoff lists in this chapter are intended to assist in complete voyage preparations. They are to be completed for each voyage regardless of familiarity with the area of operation. Completed checkoff lists are to be retained until the voyage is complete and then disposed of as directed by the Navigator.

a. The Navigation Division Pre-Underway Checkoff List (Article 5112) verifies that the division is operationally, materially, and administratively ready for underway, and should be completed prior to each underway. (R

b. The Navigation Division Piloting Preparations Checkoff List (Article 5113) is designed to fully prepare charts for piloting evolutions, and should be completed prior to each piloting evolution. (R

c. The Navigation Division Planned Operations Checkoff List (Article 5114) is designed to prepare charts for operations outside piloting waters, and should be prepared for all operations outside piloting waters. When operational changes occur following completion of this checklist, the applicable portions of this checkoff list should be redone. (R

d. The Navigation Division Entering Port Checkoff List (Article 5115) is designed to ensure that all preparations are completed for a return to port for mooring, anchoring, or personnel transfer, and should be completed prior to any of these evolutions.

4. Each ship may modify these checkoff lists to reflect equipment actually on board, or to add ship specific requirements. Modified checkoff lists must cover the areas listed in the enclosed checkoff lists unless that equipment is not installed. Modified checkoff lists need'not be forwarded to COMSUBLANT (N700) nor COMSUBPAC (701, but should be auditable against the checkoff lists in this instruction as the minimum requirements.

5. Until certified by the Defense Mapping Agency (DMA), electronic charts shall not be used as the ship's primary navigation reference. There are several commercial products available that use non-certified electronic charts which may be used for general reference and to aid in comparison of fix sources. The official ship's position and projected track shall be maintained on a DMA approved chart that has been maintained up to date with respect to Notices to Mariners.

5103 PILOTING PROCEDURES. Procedures to be followed and the organization to be used when the ship is piloting in restricted waters are covered in the Navigation and Piloting Bill of reference (c) .

5104 NAVIGATIONAL PRACTICES WHILE IN THE OPEN OCEAN. Procedures to be followed when the ship is operating in open ocean are covered in the Navigation and Piloting Bill of reference (c).

5105 FIX ACCURACY. There is no "standard accuracy" that can be routinely applied to all fixes. Each fix must be individually evaluated. The fix error to be assigned to each fix will be determined by the Navigator based on his evaluation. The fix accuracies listed below are representative values and may be applied by the Navigator lacking other information. They are not intended to supplant other technical accuracies.

FIX SOURCE	ACCURACY (N.M.)
Visual	0.1
Military GPS (FMl)	0.02
D) Bottom Contour	0.3
LORAN C	1.0
Radar	1% of range

5106 USE OF GPS

1. Military GPS receivers with crypt0 installed and keyed are authorized for use as the primary open ocean navigation fix source. Military GPS receivers provide the best position accuracy and consistency over other fix sources, including most commercial GPS receivers. Advanced commercial off-the,-shelf (COTS) GPS navigation systems, such as Differential GPS (DGPS) systems, also R) provide accurate position information and include waypoint, digital chart and other features that may not be provided by military GPS systems. COTS DGPS navigation systems may be used as a primary fix source, after careful and periodic evaluation of the system's accuracy, recognizing that commercial DGPS systems may be less accurate and consistent than keyed military GPS receivers.

2. The following procedures should provide the most accurate fix information when using GPS. Use of these procedures is mandatory to obtain GPS fixes of sufficient accuracy for use in most harbor piloting scenarios.

a. Select the correct chart datum. Most GPS receivers allow the selection of multiple chart datums. The WGS-84 datum is the most common chart datum, and is the default datum for military GPS receivers. If the incorrect chart datum is selected fix accuracy will be degraded.

b. Select the appropriate display format. Most GPS receivers allow the selection of either degrees-minutes-seconds (DMS), or degrees-minutes and thousandths of minutes (DM). The display should be selected to the same coordinates as the chart in use.

c. Record and plot fix data accurately. GPS fix data should be recorded to an accuracy consistent with the chart in use. In most piloting situations when using the DMS format, fix data should be recorded and plotted to the nearest tenth of a second. When using the DM format, fix data should be recorded to the nearest hundredth of a minute.

R) d. Record GPS Figure of Merit (FM).

3. Most GPS receivers allow the entry of way-points which may be used to enter track information or NAVAID positions while piloting. The use of this feature can provide a method of rapidly plotting a GPS fix as a bearing and range ***to a*** waypoint. Additional information is also available when waypoints are used. The following information is provided for the use of waypoints while piloting:

a. The waypoints must be accurately determined. Waypoints should be determined to the same accuracy as discussed in paragraph 2.c of this article.

b. Waypoint positions should be formally recorded in a manner similar to the list maintained for visual NAVAIDS. When recording GPS fixes as a bearing and range to a waypoint, the bearing, range, and way-point number should be recorded so that complete reconstruction of ship's track is possible.

C. The way-points entered into the GPS receiver should be checked to verify that they have been properly entered prior to their use for navigation.

d. Turn points for each leg may be used as waypoints as a backup method of marking turns. The waypoints for inbound and outbound legs will be different, and the GPS turnpoint will only be accurate when the ship is centered on track.

e. In order to take advantage of the AN/WRN-6 GPS Receiver's Cross Track Error capabilities, two waypoints per leg must be used. This can be accomplished by utilizing inbound and outbound turning points or a turning point and one other along the track, e.g. a stead point, as waypoints.

4. GPS is a highly accurate navigation aid fully certified for use and is capable of providing real-time fix information. However, proper operation is essential to obtaining the requisite accuracy. The availability of GPS does not negate the requirement to use all available means to fix ship's position.

5. The Precision Lightweight GPS Receiver(PLGR) and the Enhanced PLGR(EPLGR) are the handheld, keyed military GPS receivers distributed to all ship's as a backup to the WRN-6 receiver. The EPLGR provides cross track readout, increased waypoint capability, and other features that were not available in the original PLGR. The PLGR or ELPGR should be available for immediate use on the bridge as an aid to the OOD and CO or in some other location as directed by the CO for use in monitoring the navigational picture. (A

5107 USE OF REPLICATED CHARTS

1. The use of NIMA replicated charts is acceptable for primary navigation if the replication was at the same scale as the original chart (1:l replication).

2. The use of NIMA enlarged charts are not acceptable for primary navigation. On a case basis, the Commanding Officer may approve use of a NIMA enlarged chart, after ensuring the following additional checks have been completed: (A

a. Spacial accuracy of charted information in the area of operation has been checked against the parent chart (i.e. sounding data, sounding contours, land, shoals, operating boundaries).

b. If not included on the enlarged chart, sounding datum, geographic datum, chart edition and any applicable notes from the parent chart will be transferred to the enlarged chart.

c. Chart corrections for the enlarged chart will be in accordance with the parent chart.

d. The parent chart will be updated with recent chart corrections and kept at the QM station for ready reference.

e. The chart enlargement will be prepared and approved in the same manner as other charts.

R) **5108 NIGHT ORDERS**

1. Navigation Night Steaming Orders shall be prepared by the Navigator and will be promulgated by the Commanding Officer in his Night Orders.

2. Written guidance in Night Steaming Orders shall be thorough and not leave anything to chance. Sufficient instructions shall be provided such that predictable errors on the part of a watch section would not allow the ship to stand into danger.

3. A special entry is appropriate when transiting toward shoal water or the boundary of an area that is not assigned for operations until a specified time. For example: "Call me when soundings decrease to 200 fathoms or at 0300 whichever is earlier" or "Call me when within ten miles of L42 N or at 0400 whichever is earlier" or "Take soundings every 30 minutes. Upon reaching 200 fathom curve, or at 0130 if earlier, commence soundings every 15 minutes."

4. Navigation Night Steaming Orders can be used as an addendum to the Commanding Officer's Night orders. Night Steaming Orders are not required if the Navigator prepares the Commanding Officer's Night Orders and includes all mandatory night steaming instructions.

R) 5109 **ROUTINE REPORTS.** Unless otherwise directed, the OOD and QMOW shall ensure that the following reports are made to the Navigator:

1. All changes in course, speed, and depth, except baffle clearing evolutions unless specifically exempted by the Commanding Officer

2. Soundings that do not correlate with charted depth at the estimated position/fix position

3. Any departure from an assigned track or operating area

4. Any sudden or large change in set or drift

5. The sighting of all navigational aids

6. Any expected navigation aid not sighted at the expected time or bearing

7. When a marked change in the weather is observed or the visibility decreases to less than 8,000 yards

8. Any SINS/DMINS/ESGN/RLGN, MK 19/WSN-2 gyro compass or heading, (R reference/steering repeater comparison reading that is greater than 1.0 degree (2.0 degrees for MK 27 gyro compass)

9. Any observed malfunction in the operation of navigational equipment, including the fathometer

10. Any RED or YELLOW sounding

11. Anytime the ship's position is in doubt or the prudence of the projected track is questionable

12. Crossing the 12 mile limit from land and additional limits specified by the Commanding Officer, inbound or outbound

13. Anytime an EP plots outside the calculated position uncertainty

5110 SAFETY PRECAUTIONS **(R**

1. The safety precautions listed in the NAVSHIPS Technical Manual (Chapter 67, Section V) and reference (a) comprise the safety precautions for the Navigation Department. Each man assigned to the Navigation Department shall thoroughly familiarize himself with these references. Strict adherence by each individual with respect to all applicable safety precautions is.required. Consequently these persons should have a full appreciation of the factors and, hazards involved with high voltage power supply circuits, antennas, and antenna leads utilizing high radio frequency potentials. These include fire hazards, danger of shock to personnel, and explosive hazards when ammunition or explosive vapors are present. All personnel must be familiar with hazards to men working aloft, such as a fall complicated by possible electric shock.

R) **5111 PLOTTING SYMBOLS. DMAHC Publication No. 9 provides standard position symbols. Those standard symbols, modified for submarine use, are summarized below. All position data plotted on a chart being used for navigation will be labeled with one of the following symbols. The time the data was obtained will be indicated close to the symbol. Care will be exercised to prevent times and symbols from presenting a confused navigation picture to a second person. When plotting positions from more than one source for which the same symbol applies, each position will be labeled with both the time and source.**

Visual

Fix obtained from a combination of two or more means

RFIX Running fix obtained from visual bearings

Radar fix

BC Bottom contour fix

LC LORAN C fix

RD Fix obtained from crossed RDF lines

GP GPS fix

D) |

1,2 Inertial Navigation Estimated Position

D) |

H Hand Estimated Position

Dead Reckoning Position

5112 NAVIGATION DIVISION PRE-UNDERWAY CHECKOFF

ETD: _____ Date Started: _____

7 DAYS PRIOR TO ETD: **SIGNATURE**

1. STJBNOTE received. _____

72 HOURS PRIOR TO ETD:

1. Periscopes

   a. RAIN-X both Periscope Headwindows. _____

   b. Perform MRC 4251/R-2 on the TYPE 18 periscope.

   c. Verify film loaded in camera magazine. Replace as necessary. _____

2. AN/WSN-3A ESGN/RLGN

   a. Check both ESGN/RLGN channels in NAVIGATE. _____

   b. Verify ESGN/RLGN position with dockside. _____
   Reset as necessary with LPO and Navigator's permission.

   Dockside: LAT_____ LON_____
   ESGN/RLGN #1 LAT_____ LON_____
   ESGN/RLGN #2 LAT_____ LON_____

3. AN/WRN-6 GPS

   a. Perform MRC 4231/21 R-lD _____

   b. Obtain a dockside fix from each antenna. _____

   Dockside: LAT_____ LON_____
   TYPE 18 LAT_____ LON_____
   LAC_____ LOC_____

   BRA-34 LAT_____ LON_____
   LAC_____ LOC_____

4. AN/BPS-l5 and AN/SPA-25 Radar

   a. Test radar operation IAW MRC 4512/Ql. _____

   b. Obtain and record ringtime. _____
   Ringtime: _____

c. Perform MRC 4501/R1 on the SPA-25. _____

d. Return radar to standby. _____

R) 5. Operations Directives (SUBNOTE, OPORD, PATORD, weekly OPSKED, as applicable) received onboard. _____

6. Planned Operations/Navigation Checklist commenced. _____

7. Piloting Preparations Checklist commenced. _____

8. Electronic Navigation System Status: _____

	Sys Ready Yes/No	ReDair Status	ETR
R) SINS/ESGN/ESGM/ DMINS/RLGN			
GPS Military			
GPS Commercial 1			
GPS Commercial 2			
LORAN c			
D) RADAR Military			
RADAR Commercial			
Fathometer Primary			
Fathometer Secondary			
MK 19/WSN-2 Gyro			
MK 27 Gyro			
No 1 Periscope			

No 2 Periscope _____

Brg Trans System _____

DDRT/MK 19 Plotters _____

EM Log _____

SIGNATURE

9. All required calibration gases are onboard. _____

10. All test equipment onboard and calibrated. _____

11. 90 day supply load out onboard. _____

12. Verify list of personnel remaining in port with YN. _____

48 HOURS PRIOR TO ETD:

1. Commercial Naviuation Equipment

   a. Verify proper operation of:

      (1) Weather Fax Receiver _____

      (2) LORAN-C Receiver _____

      (3) Commercial GPS Receivers _____

      (4) VHF Radio in Control _____

2. Required charts and publications corrected up-to-date, latest Notice to Mariners charged to cards. _____

3. Last NAVINFONET download (optional) _____ _____

4. Submit completed track and piloting charts to Navigator. _____

5. IC/NAV or ACO switchboard lined up IAW SSM/NOP. _____

6. Ballast Control Panel lined up and operating IAW SSM/NOP. _____

7. Ship's Control Panel lined up and operating IAW SSM/NOP. _____

8. Ship's Alarms lined up and operating IAW SSM/NOP. _____

9. AN/WSN-2, MK 19, and MK 27 gyrocompasses lined up and operating IAW SSM/NOP. _____

(A

USS _____ NAVOPSDEPTINST 5400.

		SIGNATURE
10.	Ship's Synchro Signal Amplifiers lined up and operating IAW SSM/NOP.	_____
R) 11.	Gyrocompass repeaters checked against master heading reference.	_____
12.	AN/WIC-2 Control Cabinet lined up and operating IAW SSM/NOP.	_____
13.	Central Atmosphere Monitoring System lined up and operating IAW SSM/NOP.	_____
14.	All Bridge Suitcases tested in the bridge.	_____
15.	Ship's Depth Detector lined up and operating IAW SSM/NOP.	_____
16.	Test ship's alarms.	_____
17.	Test MC circuits.	_____
18.	Test 4MC stations.	_____
19.	Test Engine Order Telegraph.	_____
20.	Test Common Alarm Panel.	_____
21.	Depth Control/Hovering System lined up and operating IAW SSM/NOP.	_____
22.	Test Steering and Diving System operation and indication to include Vernier and Dive Stop with A-DIV.	_____
23.	Test Mast and Antenna operation and indication with A-DIV.	_____
24.	Trim and Drain Valve Position circuit lined up, operating, and indicating IAW SSM/NOP.	_____
25.	Trim and Drain pump flowmeter lined up, operating, and indicating IAW SSM/NOP.	_____
26.	EM LOG lined up, operating, and indicating IAW SSM/NOP.	_____
27.	Verify mechanical bubble on SCP is +/- .5° against AN/WSN-2 or MK 19 gyrocompass.	_____
28.	Verify all sound power phone headset holders and cabinets have headsets.	_____
29.	Sound Power Phone Matrix lined up and operating IAW SSM/NOP.	_____
30.	Division Damage Control Petty Officer has inventory all divisional damage control equipment and report any discrepancies to A-DIV.	_____

SIGNATURE

31. Test Navigation Lights. _____ (A

24 HOURS PRIOR TO ETD:

1. Commercial Radar (R

   a. Install receiver/transmitter. _____

   b. Test operate unit. Determine bearing offset(_____ degrees R/L). Verify clean sharp image and ranges correlate to charted points.

2. Sail Closeout

   a. Inspect sail for foreign materials. _____

   b. Ensure all sail cover plates are in place. _____

3. Commercial Global Positioning System

   a. Rig portable global positioning system unit, test, and stow. _____

4. Inertial navigation system operating within specifications. _____

5. MK 19/MK 27/WSN-2 Gyro in operation. _____

6. Preventive/corrective maintenance complete. _____

7. Consumable supplies for days onboard. _____

8. Required forms and record books for — days onboard. _____

9. Full allowance of equipage onboard. _____

10. Obtain azimuth and determine gyro errors. Report errors greater than 0.5 degree to the Navigator. _____

SINS/DMINS/ESGN/RLGN _____ MK _____ MK _____ (R

11. Weather forecast screened. _____

12. Bridge-to-bridge radio on charge. _____

13. Piloting Party briefed. _____

14. Divers clean EM LOG rodmeters (if ship is in port more than two weeks). _____

15. Forward and after Sound Power Phone Matrix lined up for Maneuvering Watch IAW SSM/NOP. _____

SIGNATURE

12 HOURS PRIOR TO UNDERWAY:

R) **1. Record ESGN/RLGN position error vs. dockside.** _____
LAC_____ LOC_____

a. Reset as necessary with LPO and Navigator's permission. _____

6 HOURS PRIOR TO UNDERWAY:

1. Ship's Security Lights secured, removed, stowed, and caps installed. _____

4 HOURS PRIOR TO MANEUVERING WATCH:

1. Verify the following equipment's in operation :

R) **SINS/DIMNS/ESGM/ESGN/RLGN** _____

MK 19/WSN-2 Gyro and repeater system _____

GPS _____

Radar _____

LORAN c _____

D) **MK 27 Gyro** _____

Fathometerls) _____

DDRT/MK 19 Plotters _____

EM logs _____

Periscope bearing transmission system _____

Periscopes: raise/lower/train/optics _____

Navigation lights _____
Signal Lights _____
Wireless headsets staged, batteries checked. (if used) _____
Sound-powered phone staged for back-up communications. _____

2. Helmsman's MC headset tested with Maneuvering. _____

3. All SUBSAFE REC's complete. _____

4. All hazardous and prohibited items are removed from the ship. _____

5. All division spaces cleaned and stowed for sea. _____

USS _____ NAVOPSDEPTINST 5400.

SIGNATURE

2 HOURS PRIOR TO MANEUVERING WATCH:

1. DDRT/MK19 Plotter rigged for man-overboard. (Scale: 200 yds/in) _____
2. Periscope headwindows cleaned. _____
3. Distribute charts to sonar, secondary (if used) and primary plots. _____
4. Wind (if applicable) and set all ship's clocks. Make Deck Log entry. _____
5. Obtain azimuth and determine master gyro error. (If overcast use last determined error with a dockside fix as verification.) _____
   Master Gyro SINS/DMINS/ESGN/RLGN/MK 19/WSN-2A/MK-27 (circle one)
   error _____ Visual Bearing Error _____
6. Post and/or distribute tide and current data. _____
7. Post sunrise/sunset/moonrise/moonset. _____
8. Dockside fix logged and plotted. _____
9. Reset DDRT position to dockside, and total mileage to zero. _____
10. Distribute plotting equipment and Bearing Books to Secondary, Primary Plots, and Fathometer to include:

	Primary	Secondary
Fathometer log	_____	_____
Sharpened pencils	_____	_____
Dividers	_____	_____
Compass	_____	_____
Beam Compass	_____	_____
One arm protractor	_____	_____
Three arm protractor ,	_____	_____
Nautical sliderule	_____	_____
Maneuvering boards	_____	N/A
Bearing Book	_____	_____
Position Log	_____	_____

SIGNATURE

11. Navigation Department spaces and equipment cleaned and ready for use. Bridge access trunk cleaned. _____

12. Screen NAVAREA/HYDROLANT/HYDROPAC/Broadcast Notice to Mariners messages received since initial screening. _____

13. Check gyro repeater system by simultaneous readings on all gyros and repeaters: _____

	Reading	Error
R) SINS/DMINS/ESGN/RLGN	_____	_____
MK 19/WSN-2	_____	_____
MK 27	_____	_____
Bridge	_____	_____
SCP Inboard	_____	_____
SCP Outboard	_____	_____

14. Rig bridge for getting underway. _____

15. Take sounding and log. _____

16. Determine radar range and bearing error. _____

17. Shift Bridge Suitcase to the bridge and test. _____

18. Remove tie from forward sound power phone matrix. _____

19. Shift AN/WSN-2 to EM LOG. _____

20. Shift EM LOG to "SEA". _____

NOTE: Item marked with an asterisk are to be completed for an emergency underway by the Duty Quartermaster (individual units designate).

1 HOUR PRIOR TO MANEUVERING WATCH:

1. AN/BPS-l5 Radar

a. Place in Dummy/Radiate and obtain a ringtime. _____yds _____

2. AN/WRN-6 GPS

a. Insert Crypto. _____

uss _____ NAVOPSDEPTINST 5400.

SIGNATURE

3. Commercial Global Positioning System

a. Rig portable global positioning system. _____

4. Cable TV

a. Derig TV cable. _____

5. TYPE 18 Periscope

a. Perform system focus. _____

Comments/Discrepancies:

_____

Reviewed. Navigation Division ready for getting underway. Time/Date: _____

_____
NAV DIV LPO

_____
ANAV

_____
NAVIGATOR

_____
EXECUTIVE OFFICER

uss _____ NAVOPSDEPTINST 5400.___

R) **5113 PILOTING PREPARATIONS CHECKOFF**

Port: _____

ETD/ETA: _____

1. Planning Publications:

(Sailing Directions, Coast Pilot, Fleet Guide, Light List, etc.)

NAME (Short Title)	Corrected To NTM (PUB PO)	Reviewed (ANAV)	Reviewed (NAV)

2. **Piloting Charts:** (Use of the computer modem programs of the Defense Mapping Agency (NAVINFONET) to support chart corrections is optional but encouraged.)

Number	Copies Required	On Board	Corrected To NTM (Chart PO)	Reviewed (ANAv)

3. Chart Preparation:

a. Compare all charts on allowance list covering the area.

b. Select charts for piloting. (Consider NAVAID availability, plotting surface and PMP mobility.)

c. Determine and label the following:

(1) Limit of navigable water parallel to the channel, normally the 35 foot contour curve (40 feet if desired for deeper draft submarines).

(2) Chart sounding datums (feet, fathoms, meters).

(3) Hazards (shoals, wrecks,, etc.) and layout danger bearings and ranges as appropriate.

4) Points at which tugs and pilots will rendezvous.

5) Points where currents are computed for. Indicate directions of currents

(6) Navigation Rules - demarcation lines.

(7) In channels not having man-made ranges, layout possible useful natural ranges formed by NAVAIDS for determining (verifying) Visual Bearing Error (VBE) .

(8) In channels having man-made ranges, determine bearings to the nearest tenth of a degree.

(9) OPAREAs and transit lanes clearly plotted on all charts in use.

d. Select and label (name) probable visual NAVAIDS.

e. Select and label (name) probable radar NAVAIDS.

f. Provide NAVAID identification list for bearing books.

g. Construct "Time-Speed-Distance Nomograph" for each chart, as chart scale permits.

h. Construct anchorage IAW ship operating procedures Anchoring Bill.

1. Plot four (required for SSW ships only), and twelve miles from land, and ten miles from land and/or shoal water. (R

j. Chart Datum for GPS use.

k. Plot on Piloting charts any Broadcast Notice to Mariners and Local Notice to Mariners corrections, and any Navigation Hazards and NAVAREA warnings that apply. (A

4. Track:

a. Layout track IAW Fleet Guide, Sailing Directions, Coast Pilot, etc. Allow for channel width, anticipated currents, and anticipated traffic pattern.

b. Track allows sufficient maneuvering room for possible errors in position of charted hazards and passing well clear of buoy positions.

c. Track does not cross danger bearing/ranges.

d. Turning points determined from ship's advance and transfer curves for each turn. (Fifteen degrees rudder recommended to allow ship to increase or decrease turning rate in unusual circumstances).

e. Draw a "slidebar" through each turning point (See Art. 1017 Bowditch).

f. Draw and label a turning bearing for each turn marked from a NAVAID to be used for navigation.

NOTE: The optimum turning bearing is forward of the beam, inside of the elbow formed by the old and new track and close to and parallel to the new track and slidebar.

g. Draw and label turning range arcs for each turn (For reduced visibility).

h. "Fair-in" each turn to reflect the actual track through the turn.

i. Using a PMP, determine and label courses to the nearest half degree and bearings to the nearest tenth of a degree.

j. Measure and label each track leg. (Length of leg determined from steady-on point to the next turning point). Mark estimated positions based on SOA.

k. Determine and label Red and Yellow soundings and the points at which their values change.

l. Label local speed limits and indicate the points at which they change.

m. Label chart shift points.

A) n. Plot and label GPS waypoints used for navigation.

5. Compute and graph tides and currents at locations designated by the Navigator.

6. Prepare a Navigation Plan Sheet for the piloting evolution.

7. Present piloting charts to Navigator and Executive Officer for review.

8. Present piloting charts to the Commanding Officer for approval.

9. Prepare two additional sets of identical piloting charts for use of Bridge and Secondary Plot, if used. For ease of use on the Bridge, the bridge charts may be of a different scale than those used by the piloting party in control. If they are different, they should still show the same NAVAIDs being used by the piloting party.

10. Prepare one set of piloting charts with only unannotated track for use of Sonar Supervisor.

Submitted: _____
Assistant Navigator

Reviewed: _____
Navigator

Reviewed: _____
Executive Officer

Reviewed: _____
Commanding Officer

R) **5114 PLANNED OPERATIONS/NAVIGATION** *CHECKOFF*

_____
(Brief description of passage or operation)

ETD: _____ Port/Position: _____

ETA: _____ Port/Position: _____

NOTE : **This checkoff is preparatory to operations and should not duplicate steps accomplished in the Piloting Preparations Check off.**

References: COMSUBLANT OPORD 2000/COMSUBPAC OPORD 201
Sailing Directions
Coast Pilot
Fleet Guide
OPORD/LOI

1. **Chart selection:**

a. Compare charts on allowance list covering the area.

b. Select charts for planning and track.

Number	**Plotter setting**	**Corrected/Checked (Chart PO)**

2. **Prepare Operations Binder** _____

3. **NAVAREA/HYDROLANT/HYDROPAC file up-to-date** _____

4. **Chart Preparation:**

a. Charts corrected up to date. _____

b. NAVAREA/HYDROLANT/HYDROPAC file screened for area of operation. Hazards annotated on charts. _____

c. Charts annotated with:

(1) 20, 50 and 100 fathom curves. (Use the preprinted contour on the chart closest to these values.) _____

(2) 4 (required for S5W ships only), 12 miles from land, and 10 nautical miles from land and/or shoal water. _____ (R

(3) Shoal water and hazards to navigation within 50 nautical miles of track/area of planned operation. _____

(4) Range arcs of lighted NAVAIDS within 30 nautical miles of track. _____

(5) Chart Datum for GPS use. _____

d. Charts annotated with submarine hazards. These hazards include but are not limited to: Training Minefields (CSL OPORD 2000/CSP OPORD 201), Catas Advisories, Ordnance Drop Zones, Oil Platforms, or any other unique hazard to submarine navigation provided by the SUBOPAUTH (Submarine Operating Authority). _____ (A

5. **Track/OPAREA Preparation:**

a. SUBNOTE/MOVORD track plotted on track charts. _____

b. SUBNOTE/MOVORD track second checked. _____
A-NAV

c. Moving haven or OPAREA boundaries plotted. _____

d. PIM(DTG) at a minimum of 4 hour intervals. _____

e. Track for transits through local OPAREAs plotted. _____

f. Course, SOA and distance of each leg labeled. _____

g. Chart shift points and next chart in use indicated. _____

h. Interference advisories plotted. _____

1. Maximum allowable keel depth indicated. _____

j. Red and yellow soundings and points at which they change. _____

6. **Prepare a Navigation Plan Sheet** _____

7. **(SSBN) Verify that complete achieveability arcs and deconflicted areas for all assigned areas for all assigned target packages are plotted on patrol charts.**

Submitted: _____
Assistant Navigator

Reviewed: _____
Navigator

Reviewed: _____
Executive Officer

Approved: _____
Commanding Officer

5115 NAVIGATION DIVISION ENTERING RESTRICTED WATERS CHECKOFF (R

Port: _____

ETA: _____

1. Prerequisites: Complete 24 hours prior to or 100 miles before entering restricted waters, whichever is greater.

	SIGNATURE
a. Piloting Preparations Checkoff.	_____
b. Bridge-to bridge radios tested and placed on charge.	_____
c. Anchorage or berthing location verified and complies with OPNAVINST C3000.8 or other specific authorization.	_____ NAVIGATOR
d. Sufficient depth of water at anchorage or berth through complete range of tides.	_____
e. Anchoring checklist of Anchoring Bill complete.	_____

2. CO, OOD. EOOW. Navigator, and Enuineer notified when the following distances from land are reached:

12 miles	_____
4 miles	_____

3. Prior to surfacing

a. Rig MK 19 Plotter/DDRT for man-overboard. (Scale: 200 yds/in)	_____
b. Tape Primary Plot charts to plotter/distribute charts.	_____
c. Wind and set all ship's clocks, log in Ship's Deck Log.	_____
d. Post Marine Weather Forecast frequency in ESM Space.	_____
e. Assemble material for rigging the bridge.	_____
f. If used, ensure the military hand held GPS unit has fresh batteries and crypto installed.	_____ (A

4. After surfacing

a. Verify VBE with azimuth using both periscopes if possible, check all bearing repeaters for operation and accuracy.	_____

SIGNATURE

b. Verify operation and accuracy of radar. If within range of land, compare bearing and range with charted bearing **and** range. If not in range of land, attempt verification by plotting of contacts. (Verify ranges with periscope stadimeter.) _____

c. Test searchlight and Aldis lamp. _____

d. Test navigation lights. _____

e. Rig the bridge. _____

f. Monitor weather (WX) channel on console bridge-to-bridge periodically. _____

g. CO's and ship's binoculars cleaned, tested and staged. _____

A) h. Verify the operation of the hand held GPS. Compare fix information with the AN/WRN-6/M267N. _____

5. One hour prior to restricted waters

a. Distribute plotting equipment and Bearing Books to Primary and Secondary Plots:

	Primary	Secondary
(1) Sharpened pencils	_____	_____
(2) Dividers	_____	_____
(3) Compass	_____	_____
(4) Beam Compass	_____	_____
(5) One-arm protractor	_____	_____
(6) Three-arm protractor	_____	_____
(7) Nautical sliderule	_____	_____
(8) Bearing Book	_____	_____
(9) Maneuvering Boards	_____	N/A

b. Check operation of PMP. _____

c. Cause the messenger to awaken the Navigation Team. _____

d. Ensure fathometer watch is issued fathometer log when stationed. _____

e. Wireless headsets staged and tested (if used). _____

f. Sound-powered phones rigged for backup communications _____

Reviewed:

_____ DIV LPO	_____ A-NAV
_____ NAVIGATOR	_____ x0

5116 NAVIGATION EVALUATION CHECKLIST (R

This evaluation shall be conducted on the ship at intervals not to exceed annually. It may be conducted by ship's force or by personnel from outside the ship, but external evaluation is preferred. This completed evaluation checklist should be retained until superseded.

Part I - Piloting Team Evaluation

EVALUATION FACTORS	**SAT**	**UNSAT OR COMMENT**
a. Does the Navigator organize his navigation team per SOP/SSM Navigation and Piloting Bill?		
b. Does he have the knowledge and confidence so that he can continually monitor the performance of his team and rectify faulty operating procedures on the spot? If he gets a poor fix or cannot get a fix does he immediately inform the CO and OOD?		
c. Records:		
(1) Bearing Record Book		
(2) Fathometer Log, including red and yellow soundings, etc.		
(3) Ship's Deck Log entries		
d. Charts. Are charts up to date; do they contain danger bearings, ship's track, etc? Are the largest scale charts always used? Does the bridge have adequate charts with backup information? Are secondary (if used) plot and sonar charts properly prepared? Are red and yellow soundings and points where charts are to be shifted annotated on all charts?		
e. Pre-plan the move. Prior to stationing the maneuvering watch: Navigator, OOD, and CO review the chart, decide on track; check selected NAVAIDS (visual and radar); determine state of tide, probable current direction and strengths. If port is unfamiliar, review Sailing Directions and Fleet Guide. Hold Navigation Party brief (minimum of quarterly for homeport).		
f. Piloting procedures:		
(1) DR used, a "cyclic routine" performed by Navigation Plotter for each fix.		
(2) Set and drift computed and applied to recommendations (including Fire Control System Operator and/or SINS/ESGN(M)/RLGN inertial velocity set and drift determination).		

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	SAT	UNSAT OR COMMENT
(3) Sounding info compared with charts. Sounding reported with each fix and properly logged.		
(4) Last fix plotted on new chart when charts shifted.		
(5) Buoy positions verified from fix information.		
(6) Fix interval proper.		
(7) Light characteristics posted when applicable, and properly timed.		
(8) Radar used in piloting and radar fix info compared with visual fix info to establish radar/ visual fix errors, i.e., what is consistent radar fix error and in what direction? How often is radar information used on primary navigation plot?		
(9) Turning bearings use the same NAVAIDS as those used for navigation plot where possible?		
(10) Does piloting party conduct business in a quiet efficient manner?		
(11) Adequate piloting under conditions of reduced visibility, including organization, procedures, and use of all available sensors, i.e., GPS, RADAR, sonar.		
(12) Bearing transmission checked using visual ranges; reported to bridge; utilized in adjusting visual fixes.		
(13) Gyro error frequently determined. Change in gyro error recorded in Bearing Book and reported to CO, OOD, Navigator, and piloting party.		
(14) Is a DR projected to include at least the estimated positions of the next two fixes.		
(15) Is secondary plot stationed utilizing primarily electronic information (not req'd if being plotted on the primary plot)?		
(16) Is sonar used as navigational input?		
(17) Are suspected erroneous fixes erased?		
(18) Does Navigator ensure track for his recommended course changes is clear?		
(19) Waypoints on GPS?		
(20) Correct chart datum selected on GPS?		
g. Reports. Are the Navigator's reports to the OOD complete and accurate? Do they include:		
(1) Course/speed recommendation to remain on track.		
(2) Turn recommendations.		
(3) Notification when charts are shifted.		
(4) Adequate sounding information including danger and caution sounding recommendations.		

	SAT	UNSAT OR COMMENT
(5) Position info that can be readily identified by OOD.		
(6) Sightings of major land marks.		
(7) Distance to closest shoal water.		
(8) Problems experienced with piloting.		
(9) Positive statement when the OOD does not follow his recommendations such as: "I do (do not) concur with your course of action" and logged in Deck Log.		
h. Does plotting team understand the plotting sections of DUTTON and BOWDITCH (spot check)?		
i. Material. Is all piloting equipment in commission?		
(1) Maintenance done and recorded.		
(2) Measures in use to verify accuracy prior to underway and during operation.		
j. Abnormal conditions. Evaluate the ship's ability to pilot under abnormal conditions during the following drills:		
(1) Loss of gyros/piloting with the three-arm protractor		
(2) Red/yellow soundings		
(3) Reduced visibility/radar piloting		
(4) Loss of communications		
(5) Loss of steering		
(6) Man overboard		

Part II - Open Ocean Navigation Evaluation

a. Does OOD actively supervise, independent of the Navigation Supervisor, the QMOW in executing his primary responsibility for the safe navigation of the ship? Evaluation should include the following:		
(1) OOD check of chart on relief including verification of last fix time and position, present ship's position, proximity to shoal water and evaluation of fix data.		
(2) OOD reports to CO and Navigator on the following:		
(a) All changes in course, speed, and depth except as directed by the CO.		

	SAT	UNSAT OR COMMENT
(b) Soundings which do not correlate with chartered depth.		
(c) Any malfunction in the operation of navigation equipment (including fathometer).		
(d) Failure to obtain an expected fix or fixes failing to be within accuracy prescribed by the CO/Navigator.		
(e) Does OOD monitor independent methods of position keeping between fixes? Does he report when variance between position keeping methods exceeds tolerance specified by the CO and Navigator?		
(3) OOD evaluation of fix and sounding information.		
b. Is the ship's planned track properly plotted? Evaluation should include the following:		
(1) PIM (DTG) at a minimum of 4 hour intervals		
(2) Chart largest scale chart available		
(3) Chart clearly indicates shoals and other hazards to navigation		
(4) MHN indicated		
(5) Second check indicated for accuracy and corrections		
(6) Chart approved by CO		
c. Is accurate DR maintained at all times? Does DR reflect all course and speed changes, including baffle clearing maneuvers?		
d. Is ship's position plotted at least every 30 minutes using available fix information or SINS/DMINS/ESGN/RLGN/ ESGM estimated positions?		(R
e. Are DR, DRT Plotter, DDRT, and SINS/DMINS/ESGN/RLGN/ ESM reset only when directed by the Navigator? Is the OOD informed when these resets occur? Are these resets independently checked by the OOD to ensure they are properly entered?		(R
f. Is the ship proficient in manual bottom contour navigation?		

	SAT	UNSAT OR COMMENT
g. Are **RED** and YELLOW soundings established and clearly indicated on the chart in use? Is the sounding interval chosen with regard to speed, depth, and proximity of shoals? Are proper actions taken when YELLOW soundings or RED soundings are encountered?		
h. Are all new fixes evaluated by an experienced individual (CO, XO, NAV, ANAV) under the following guidelines:		
(1) When not receiving continuous navigation fix information (e.g., continuous GPS) each new fix must be evaluated by one of the above individuals.		
(2) When receiving continuous fixes, a comparison between GPS for instance and any other fix information must be made periodically.		
i. Is the concept of fix expansion understood by QMOW and OOD? Is selection of keel depth made with full consideration of fix expansion and the proximity of shoal water and known hazards to navigation. Is sufficient margin of safety/ clearance provided for the navigation error expected? How is fix expansion used with regard to assigned operating areas and MHN's?		
j. Is navigation equipment operated by fully qualified personnel? Is the OOD informed of any navigation equipment malfunctions, and are suspected malfunctions resolved by qualified maintenance personnel in a deliberate, timely manner?		
k. Is the ship's EM log accurately calibrated?		
l. Are Navigation Watches involved in the actual navigation of the ship? Do they look at the chart? Is SINS/ DMINS/RLGN/ESGN/STET error curve/AMP properly maintained (SSN)? Is it used to plot/evaluate SINS/DMINS/ESGN/RLGN/ESGM positions?		(R
m. Does formal procedure exist for voyage planning and is it used on each transit?		
n. Does OOD effectively monitor navigation when on the surface?		(D
o. Are Azimuths taken (if appropriate)? Are compass checks made of master gyro and the helm steering gyro repeater? How recorded? At what frequency? When are CO/OOD informed of gyro error?		(R

		SAT	UNSAT OR COMMENT
R)	p. Do QMOWs and OODs understand the significance of MHN and actions required if the ship is out of its MHN?		
R)	q. Are the provisions for "restricted water navigation" judiciously applied when operating surfaced or submerged within ten miles of land, in shoal water or near other hazards to navigation?		
R)	r. Does the Navigator and do QMOWs have an understanding of how to use the SFMPL to take a celestial fix?		
R)	s. Is set and drift computed with each fix when practicable?		
R)	t. Are soundings taken prior to diving, prior to increasing depth, with every fix and IAW SOP/SSM. Are they properly recorded and compared with charted soundings?		
R)	u. Is a check of the heading reference and steering repeater made every hour?		
R)	v. Are SINS/DMINS/ESGN/RLGN and gyro compass compared each watch? If a difference of greater than 1.0 degree (2.0 degrees for MK 27) is observed, is it immediately reported to OOD and NAV?		
R)	w. Are all required reports made in a timely manner to the OOD/NAV?		
R)	x. Are the QMOWs working the open ocean navigation problem or are they simply recording inertial navigation information provided by the NAV Watches? How accurate is their HAND DR?		

Part III - Navigation Division Administration

	a. Are chart and publication holdings per TYCOM allowance? (Spot check)		
	b. Are charts/publications corrections accomplished using Chart/Publication Correction Record Card System as described in Catalog of Maps, Charts, and Related Products-Part 2 Hydrographic Products Volume XII?		
	c. Has the Commanding Officer designated in writing which charts should be maintained corrected up-to-date? Is the list reasonable?		

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	SAT	UNSAT OR COMMENT
d. Are HYDROLANT/HYDROPAC and NAVAREA messages maintained in an accountable system? Are they reviewed by designated personnel and utilized to correct charts and publications?		
e. Are Notice to Mariners promptly reviewed, charged on Chart/Publication Correction Record Cards, and corrections made where required?		
f. Does the Navigation Workbook provide a record of all navigation observations and computations made for the purpose of navigating the ship, including Azimuth computations, celestial navigation data, etc?		
g. Are position reports made to the Commanding Officer at 0800 and 2000 each day?		(R
h. Does the Bearing Record Book used for piloting include a list of abbreviations for the NAVAIDS used so that the record will stand on its own?		
i. Does the Current Operations Binder have subsections, as a minimum, for current OPORD, SUBNOTE, NOI, and Interference Advisories?		(R
j. Has the NODORM been routed to each man assigned to the Navigation Department and every OOD and have these personnel certified understanding in writing?		
k. Are all navigation equipment which are out of commission, out of calibration, or operation in a reduced status logged in the ship's equipment status log?		
l. Are 3M schedules properly prepared?		
m. Is the NAVOPSDEPT organization per the Navigation/ Operations Department Organization Manual?		
n. Are the Navigation/Operations Department checkoffs used and do they contain adequate information?		
o. Has corrective action from the previous Navigation and Piloting Team evaluation been taken?		

	SAT	UNSAT OR COMMENT
p. Review following publications/logs:		
(1) Ship's Deck Log		
(2) Topside Watch Log		
(3) Ship's Position Log		
(4) Navigation Workbook		
(5) Bearing Book		
(6) Fathometer Log		
(7) Chart/Publication Correction Card File		
(8) NAVAREA/HYDROLANT/HYDROPAC File		
(9) Notice to Mariners		
(10) Broadcast Notice to Mariners/Local Notice to Mariners on file		
(11) Ship's Position Reports		
(12) Communications Log		
(13) Department Training Records		
q. Commanding Officer's Night Orders:		
(1) Are night orders prepared for each night underway and at anchor?		
(2) Do night orders include expected evolutions, OPAREA assignment changes, expected NAVAIDS, fix interval, red and yellow soundings, and night steaming instructions?		
(3) Are night orders read and initialed by designated watchstanders?		

Part IV - Training

a. Has the Navigator completed all mandatory training courses? _____

b. Have Navigation/Operations Department personnel met minimum training requirements? _____

c. Is there an up-to-date listing of qualified watchstanders for each navigation team watch station? _____

d. Is the qualification progress of unqualified watchstanders adequately monitored? _____

e. Is NAVOPS Department training consistent with the ship's training plan? _____

f. What team training has been conducted? _____

g. Does the Navigator plan and direct the navigation training of OODs and JOODs? _____

	SAT	UNSAT OR COMMENT
h. Do OODs and JOODs understand their navigation responsibilities?		
1. Was the last piloting evaluation conducted within 12 months?		
j. Have the grounding and collision presentations been given to all officers and all members of the piloting team within the past 12 months?		
k. For those ships equipped with AN/BQN-17 fathometer, has at least one sonarman graduated from the AN/BQN-17 combined Maintenance Course and has BQN-17 operation on board training been conducted? Spot check fathometer operators' level of knowledge.		
1. Do the requirements for qualifying as radar operator include the provisions that he be knowledgeable in the procedures of N.O. Publication 1310?		
m. Does the piloting team understand the piloting and plotting techniques presented in Dutton's Chapters 11, 12, 14, and 15?		

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R) **5117 COMMUNICATION DIVISION PRE-UNDERWAY CHECKOFF**

ETD: _____ Date Started: _____

	ET INITIAL	DATE TIME

96 HOURS PRIOR TO UNDERWAY:

1. Prepare and transmit GUARDSHIFT request.
2. If ETA for the next port-of-call is within 72 hours of underway send LOGREQ message.
3. COMMPLAN typed and in route.

72 HOURS PRIOR TO UNDERWAY:

1. Administrative
   a. Ensure all required CMS material is onboard. (CMS Custodian verify)
   b. Issue CMS material as necessary. (CMS Custodian)
   c. Verify test equipment calibration dates effective and equipment onboard.
   d. Verify critical spares onboard (RPPO).
   e. Verify with YN, list of personnel remaining in-port (COMM LPO).
   f. Ensure 90 day consumable requirements onboard.
   g. Review and update ESL and OOC Log.
R) h. Ensure all LSCIA/PSCIA, LSCIB/PSCIB, CIA/CIB, and general message traffic is onboard.
   i. Ensure effective SPECOMM frequencies entered, checked, and verified.
   j. Search for atmosphere contaminants, all unauthorized removed or registered with MDR.
   k. Ensure all burn bags are shredded.

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ET INITIAL DATE TIME

2. Equipment/systems

a. AN/WLQ-4

(1) Perform PMS MRC 4253/003 (R-3). _____

(2) Perform operational test on POS 5 and COTD, IAW ESM Operators Guidelines. _____

(3) Verify signal reception in all bands from both the Type 18 Periscope and the BLA-4 DF Antenna. _____

(4) Process at least three signals on each receiver. _____

(5) DF at least three signals in each frequency band. _____

(6) Prepare ESM search plan IAW NWP-3-13.10.1, route and file ESM search plan in ESM notebook, OOD info sheet in OOD notebook. _____

(7) Task all receivers IAW approved search plan. _____

b. AN/BRD-7

(1) Test operate the AN/BRD-7 IAW MRC 4721/R54 (R-1D). _____

(2) Verify signal reception in all bands from both the Type 18 Periscope and the BRD-7 Antennas. _____

(3) Return system to standby. _____

c. Coordinate with the FT Division in performing all reouired fire control system up-dates/checks on DLCS/Link ll/OTCIXS: (both BRA-34s) _____ BRA-34 #l BRA-34 #2

(1) Transmit OTCIXS Communications opnote with COMSUBLANT/COMSUBPAC STT. _____

(2) Copy sufficient data to update the fi le. _____

(3) Perform Single Station POFA. _____

ET INITIAL DATE TIME

d. Test Operate ALL receivers:

(1) Using WRR-3, copy VALLOR broadcast (if available). _____ BRA-34 #1 BRA-34 #2

(2) Using each R-1051, copy VALLOR broadcast. (when available or HF time tick). _____

(3) Using WRR-7 copy VERDIN broadcast. _____

(4) Passively copy SSIXS broadcast. _____

e. Test operate all transmitters. Note: Ensure all safety requirements are followed and that Duty Officer's permission has been received prior to transmitting.

(1) HF Communications (AN/URT-23)

(a) Establish communications on' HF ORESTES. _____

(b) Establish communications on HF HICOM. _____

(c) Establish communications on HF ANDDVT. _____

(d) Conduct pre-transmission checks on AN/BRT-2 (SPECOMM TECHNICIAN). _____

NOTE: Perform with SESEF Pearl Harbor or SESEF Norfolk 16080khz if available

(2) UHF Communications (AN/WSC-3) _____

(a) Query the satellite on each BRA-34. _____

(b) Establish communications on VINSON. _____

(3) EHF Communications (AN/USC-38(V)3)

(a) Test operate the EHF system in all modes. _____

f. Test operate KL-51. Check encrypt/decrypt modes/run a tape. _____

	ET	INITIAL	DATE	TIME

g. Emergency/Portable Equipment

(1) Commence charging all Bridge-to-Bridge radios.

(2) Perform R-6, R-7, and R-24 of MIP 4415/004.

(3) Verify SLOT Buoy allowance onboard:

Channel #	#Onboard	Allowance	Channel #	#Onboard	Allowance
25		4	29		4
27		4	31		4

(4) Verify BRT-6 allowance onboard:

# Onboard	Allowance
	10

(5) Check T-616's and EPIRB for proper stowage.

h. Conduct the following situational PMS requirement.

(1) AN/BRA-34 # 1 (c-498/001-62, M-2R)

(2) AN/BRA-34 # 2 (c-498/001-62, M-2R)

(3) TS-3858 (C-561/001, R-l)

(4) J-3780/UYK (4151/RlO,R-1)

(5) AN/UGC-136'S (4451/R36-33, Q-IR)

(6) ANT TRANS ASSY (A-090/005, R-2M)

1. Test Operate all Teleprinters.

j. Floating Wire AS-3434(V4)

(1) Run floating wire out through the bridge.

(2) Use the CU-2364 antenna coupler to receive:

(a) VERDIN (VLF)

(b) VALLOR (LF) (When available)

(c) HF Time tick (HF)

k. Load crypto in the GPS system. _____

1. AN/APX-72 IFF

(1) Perform MRC R605/3 R-1M and S-2R. _____

(2) Insert proper Mode 1 and Mode 2 codes. _____

3. 72 hour discrepancies/status:

_____

_____

_____

_____

COMM LPO_____ DEPT LCPO_____ COMMO_____
NAVIGATOR_____

48 HOURS PRIOR TO UNDERWAY:

1. Administrative	ET INITIAL	DATE TIME
a. Ensure all pending message corrections to communications publications are entered or onboard.	_____	_____
b. Ensure all corrective maintenance has been completed or exceptions reported to the Communicator.	_____	_____
c. Ensure the PMS schedule is up-to-date.	_____	_____
d. Update the status of any 72 hour discrepancies.	_____	_____

2. 48 hour discrepancies/status:

_____

_____

_____

_____

COMM LPO_____ DEPT LCPO_____ COMMO_____
NAVIGATOR_____

24 HOURS PRIOR **TO UNDERWAY**:

		ET INITIAL DATE TIME
1.	Administrative	
	a. Ensure all pre-underway related outgoing messages are delivered to Communications Center. (CASREPS/SITREPS)	
	b. Finalize and post the COMMPLAN in Radio and OOD Notebook. **ALL ET's READ COMMPLAN.**	
	c. Prepare call-sign list and post in Radio (have second copy ready for use on the CONN).	
	d. All Radio spaces cleaned and stowed for sea.	
	e. Copy SID 55 for ET's. SIDs 70, 74, and 76 for FT's.	
	f. Start all logs.	
2.	Equipment/Status	
	a. Copy VLF/LF broadcast ZBO.	
	b. Copy SSIXS/OTCIXS broadcast.	
	c. Commence broadcast guard shift.	
	d. Ensure KIT-1C and GPS are loaded.	
	e. Test operate all Bridge-to-Bridge radios.	
3.	Update the status of any 48 hour discrepancies.	
4.	24 hour discrepancies/status:	

_____

_____

_____

_____

COMM LPO_____ DEPT LCPO_____ COMMO_____

NAVIGATOR_____

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4 HOURS PRIOR TO UNDERWAY:

		ET INITIAL DATE TIME
1.	Administrative	
R)	a. Perform last Gateguard download.	
	b. Update ESL and Equipment OOC log.	
2.	Equipment/System	
	a. Conduct radio checks and commence monitor on Harbor Common and Command Early Warning Nets.	
	b. Conduct radio checks and commence monitoring HF ORESTES/SENNET Net.	
	c. Test operate Bridge-to-Bridge radios.	
3.	COMM LPO notify Dept LPO of status to get underway.	
4.	Update the status of any 24 hour discrepancies.	
5.	4 hour discrepancies/status:	

COMM LPO_____ DEPT LCPO_____ COMMO_____ NAVIGATOR_____

1 HOUR PRIOR TO UNDERWAY:

		ET INITIAL DATE TIME
1.	Muster all Radiomen.	
2.	Post call sign list in control.	
3.	Deliver (2) VHF radios to the bridge.	
4.	Verify Radio stowed for sea (COMM LPO).	
5.	AN/APX-72 IFF	
	a. Insert codes for Mode 4 if applicable.	
6.	Equipment Out of Commission/Deficiencies:	

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Check off completed at _____ on _____

Submitted: _____
Duty Radioman

Reviewed: _____ Noted: _____
Duty Officer

Reviewed: _____
Communications Officer

Reviewed: _____
Navigator

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CHAPTER VI

LOGS AND RECORDS

(A

6100 INTRODUCTION

1. This chapter provides, where possible, detailed instructions for all logs, records, and reports normally required to be maintained by the Navigation/Operations Department. These instructions are specifically tailored to meet the needs of submarines, but also include references necessary to meet the requirements of higher authority.

2. The importance of keeping complete, concise, and accurate navigation logs and records cannot be overemphasized. Beside providing the recorded history of the ship, they become a basis for evaluation of material, operational, and personnel deficiencies in submarine warfare and should it ever become necessary they compose the legal records examined by courts of inquiry and official investigations.

3. Black ball-point pen will be used in all logs and records except in the Navigation Workbook, in which pencil is authorized for computations. For other than the Navigation Workbook, corrections may only be made by neatly lining out the incorrect entry with a single line, then neatly inserting the correct entry. The initials of the person responsible for the log or record will be placed in the left-hand margin alongside the entry.

6101 SHIP'S DECK LOG

1. Purpose. The basic requirements for maintaining Ship's Deck Logs are contained in references (a) and (1). The deck log shall be a complete daily record, by watches, in which shall be described every circumstance and occurrence of importance or interest which concerns the crew and the operation and safety of the ship or which may be of historical value.

2. Format. The Ship's Deck Log shall be maintained in computerized format or on the forms delineated by OPNAVINST 3100.7.

3. Instructions for maintenance. A copy of this article and reference (m) shall be placed in the inside front cover of the Ship's Deck Log Binder. In addition to the basic instructions contained in reference (m), the following instructions apply:

The Ship's Deck Log is the official record of the ship. No page shall be rzmoved therefrom nor shall any page be used for other than its intended purpose.

b. The Ship's Deck Log shall be kept by the Quartermaster of the Watch (QMOW) underway and the Duty Navigation Electronics Technician in port. The R) QMOW/Duty Nav ET will log his relief in the log using his rank, rate and name I and that of his relief. The QMOW/Duty Nav ET signature is not required.

c. The Officer of the Deck (OOD)/Duty Officer shall review the log, initial any corrections, add any necessary comments, and sign the log immediately upon his relief.

A) d. Log the name and time of stationing, relieving and securing of the I CDO.

R) e. Log the commencement, major milestone, and completion of changes in the normal operational or casualty status of the reactor. Include major changes in propulsion and electrical lineups. Log the status of the reactor in the midwatch entry.

R) f. Log major changes/abnormalities in the ship's and navigation systems.

R) g. Log 4 (required for S5W ship's only) and 12 miles from land, and 10 I miles from land and/or shoal water, inbound and outbound.

R) h. Log crossing of 20, 50, and 100 fathom curves, inbound and outbound.

R) 1. When starting a new day, enter ship's present course, speed, and depth I in columns 30-40 alongside the midwatch entry.

R) j. Log completion of compass checks. If the difference between remote I repeaters, between MK 19, WSN 2, and ESGN/RLGN/SINS exceeds 1.0 degree or if the difference between MK 27 and any other heading source exceeds 3.0 degrees, log the action being taken to rectify the situation, and subsequent resolution of the problem.

k. Log the results of azimuth determinations or other means of determining visual bearing error. (R

1. Helm and engine orders. Reference (1) states "Abbreviations in the Deck Log shall be limited to those generally accepted throughout the Navy by reason of long and continued usage." To provide continuity throughout the Atlantic/Pacific Fleet Submarine Force, the following helm and engine order abbreviations will be used: (R

Abbreviation	State order
RFR (LFR)	Right (Left) full rudder.
LFR (RFR)	Shift your (the) rudder. (Enter the resultant rudder)
L5R	Left five degrees rudder.
R10R	Right ten degrees rudder.
R10R 090	Right ten degrees rudder, steady course 090
RAMID	Rudder amidships.
MEET HR	Meet her.
R050	Come right to course 050.
L050	Come left to course 050.
SAYG	Steady as you go.
S080	Steady course 080. (Use this entry when there is no room for the ordered course on the same line as the rudder order.)
ASTOP	All stop.
AA1	All ahead one third.
AA2	All ahead two thirds.
AAS	All ahead standard.
AAF	All ahead full.
AAFLK	All ahead flank.
AB1	All back one third.
AB2	All back two thirds.
ABF	All back full.
ABE	All back emergency.
MT5	Make turns for 5 knots.
M5L	Make 5 knots by log.
M145T	Make 145 turns.
MD300	Make your depth 300 feet.

NOTE: The abbreviations c/c (changed course), c/s (changed speed) and c/d (changed depth) are not helm and engine "orders" and are not to be used in the Ship's Deck Log. The intent of the "order" column is to provide as accurate a record as practical of the actual orders issued.

4. **Responsibility for Maintenance.** The OOD is responsible for the completeness, accuracy, and legibility of the Ship's Deck Log for his watch. He shall ensure that the log meets all the requirements of this instruction and of higher authority.

5. **Responsibility for Review and Approval.** The Navigator shall review the Ship's Deck Log daily and shall sign the original and duplicate cover sheets monthly. He will submit the ship's Deck Log to the Commanding Officer at the end of each month and upon change of command for his approval and signature.

6. **Disposition.** The Ship's Deck Log shall be retained/forwarded in accordance with reference (m).

6102 TOPSIDE WATCH LOG

1. **Purpose.** The Topside Watch Log shall provide a complete and detailed chronological record of all events pertaining to the external security and affairs of the ship and adjacent areas when the ship is moored or at anchor.

2. **Format.** A copy of SSORM Articles 2306 and 2307 shall be mounted in the front of the log.

3. **Instructions for Maintenance**

a. The Petty Officer of the Deck shall maintain this log. All entries will be made in ink using black ball-point pen. There shall be no erasures--all corrections shall be made by lining out the incorrect information with a single line ad initialing.

b. A new page shall be started 0000 each day.

c. The following shall be logged:

(1) The arrival and departure of the Commanding Officer and the Executive Officer.

(2) Fueling and defueling of the ship.

(3) Loading and unloading of oxygen and nitrogen.

(4) Loading and unloading of weapons and ammunition, including the serial number and/or MARK and MOD numbers. The loading and unloading of nuclear weapons will not be logged.

(5) Sunrise and Sunset.

(6) Morning and evening colors.

(7) Draft readings immediately upon mooring, once an hour and before and after any loading or unloading of the ship.

(8) Any special evolutions on board or in the area adjacent to the ship.

(9) Anyone, Commander (or equivalent) and above, who comes aboard for any reason.

(10) Where moored, how moored, ships present, and weather (on setting the watch and at midnight).

(11) Mooring or getting underway of ships in the area.

(12) Assuming and relieving of the watch, including assuming custody of web belt, holster, weapon (with serial number), number of clips and rounds of ammunition, flashlight, and whistle. Signature of the off-going watchstander is required.

(13) Any injuries topside to crew, civilians, or shipyard personnel.

(14) The Duty Officer and Duty Chief Petty Officer whenever relieved.

(15) Log the time that the following make their round of inspection topside: The Duty Officer, Engineering Duty Officer (EDO), Duty Chief Petty Officer (DCPO), and Engineering Duty Petty Officer (EDPO).

(16) Changes in the weather.

(17) The reporting aboard of all new ship's force personnel, and the transfer of all officers. Entries should include name, rate/rank and social security number.

(18) The commencement and securing of all divers' operations in the vicinity of the ship.

4. **Responsibility for Maintenance**.

a. The Petty Officer of the Deck is responsible for maintaining this log.

b. The Topside Watch Log will be kept in the custody of the Navigation Department Charts and Publications Petty Officer when the watch is secured for sea.

c. The Duty NAV ET will review the log daily prior to 0800 local, initial the log, and bring any discrepancies to the attention of the Department Leading Petty Officer who will review the proper procedures with the watchstander concerned. The Duty NAV ET will transpose appropriate log entries for entry into the Ship's Deck Log.

5. **Disposition**. When the log is filled, it will be replaced and the old log retained by the Navigation Division Leading Petty Officer for 6 months.

6. SAMPLE ENTRIES FOR THE TOPSIDE LOG

a. Every injury, accident, or casualty, however slight, among officers, crew, passengers, or visitors onboard, including full particulars:

0920: WHILE LOADING EXERCISE TORPEDOES, SA I.M. BLIND, USN, 777-27-9186, RECEIVED A WRIST FRACTURE WHEN A TORPEDO STRUCK HIS RIGHT ARM. NOT DUE TO MISCONDUCT. TREATMENT: ADMINISTERED BY SHIP'S CORPSMAN. TRANSPORTED TO MAKALAPA CLINIC FOR ADDITIONAL MEDICAL CARE:

b. All peculiar or extraordinary weather or sea conditions:

1130: VISIBILITY DECREASED TO 1000 YARDS DUE TO HEAVY RAIN. COMMENCED SOUNDING FOG SIGNALS AT ONE MINUTE INTERVAL.

c. When at anchor, the time the vessel swings due to a change in tide and the strain upon the anchor chain:

1610: COMMENCED SWINGING TO FLOOD TIDE, STERN SWINGING TO PORT.

1910: COMPLETED SWINGING TO FLOOD TIDE, HEADING 006.

d. The time when any particular evolution or exercise was commenced or completed, such as maneuvering watch, shifting berths, fueling, receiving fresh or pure water, drills, loading or unloading torpedoes and missiles.

0900: COMMENCED FUELING, DRAFT FWD 28'4". DRAFT AFT 29'3".

1250: HELD COLLISION DRILL.

1259: SECURED FORM COLLISION DRILL.

1400: COMPLETED FUELING, HAVING RECEIVED 3,000 GALLONS OF DIESEL FUEL. DRAFT FWD 28'3", DRAFT AFT 29'3".

1445: COMPLETED LOADING TORPEDOES, HAVING RECEIVED 1 MK 48 ADCAP WARSHOT TORPEDO SERIAL NUMBER 20025.

1730: COMMENCED A BATTERY CHARGE.

1820: SECURED BATTERY CHARGE DUE TO LOSS OF AIR FLOW INDICATION.

1830: RESUMED BATTERY CHARGE.

2209: COMPLETED ALL REQUIREMENTS FOR A NORMAL BATTERY CHARGE.

e. All occurrences of importance or interest, including change of command, official visits, flags displayed, courts-martial aboard, etc.

1100: THE HONORABLE A. S. JONES, SECRETARY OF THE NAVY, CAME ONBOARD. BROKE THE FLAG OF THE SECRETARY OF THE NAVY.

1300: THE SUMMARY COURTS-MARTIAL, LT E. Z. JUSTIS, USN, CONVENED IN THE CASE OF FN A. R. STELLY, USN, 931-31-6723.

f. All formal inspections, concerning personnel, material, administration, operational readiness, etc., conducted by the Commanding Officer or an officer senior to him.

1820: COMMENCED CAPTAIN'S BELOW DECKS INSPECTION.

1900: COMSUBGRU NINE, MEMBERS OF HIS STAFF, AND INSPECTION PARTY, LEFT THE SHIP. HAULED DOWN HIS FLAG.

g. All deaths aboard, with statement as to exact time and cause of death as confirmed by the Medical Officer.

2230: QM2 D. D. DIRDGE, USN, 900-19-3409, DIED ON BOARD A RESULT OF A FALL FROM THE FAIRWATER PLANES TO MAIN DECK AT 2157 THIS DATE.

h. The name of all passengers with the time of boarding and departure.

1730: MR. C. F. NELSON (CIVILIAN/TECHNICIAN), EMBARKED AS AN OBSERVER FOR A PERIOD OF THREE (3) DAYS, AUTHORITY CNO MSG 192213Z MAR 96.

i. Periodic inspections and tests, such as topside half hourly inspection, and docking inspections.

1400: MADE INSPECTION OF TOPSIDE AREA. CONDITIONS SATISFACTORY. DRAFT FWD 28'4", DRAFT AFT 29'4".

1430: THE DUTY OFFICER COMPLETED HIS TOUR OF TOPSIDE. CONDITIONS SATISFACTORY.

j. Drafts forward and aft upon mooring and every hour.

1730: MOORED STBDSIDE TO PIER S9 U.S. NAVAL SUBMARINE BASE, PEARL HARBOR, HI. DRAFT FWD 28'6", DRAFT AFT 29".

k. The conditions under which the watch was relieved:

0845: WATCH PROPERLY RELIEVED BY SN W. M. EROP, USN. RECEIVED ONE .45 CAL. PISTOL, SERIAL 598719, TWO CLIPS WITH FOURTEEN ROUNDS OF AMMUNITION, WEB BELT, HOLSTER, FLASHLIGHT, AND WHISTLE.

CONDITIONS SATISFACTORY. DRAFT FWD 28′4″, DRAFT AFT 29′3″. (IF NOT SATISFACTORY, LIST ALL DISCREPANCIES AND NOTIFY SECTION LEADER, DUTY CPO, AND DUTY OFFICER.)

l. Other ships or boats getting underway or coming alongside:

0900: MCKEE DIVING BARGE MOORED TO PORT QUARTER.

1020: USS HONOLULU (SSN 718), UNDERWAY FROM ALONGSIDE.

m. Sample mid-watch entries.

0000 - 0040

Duty Officer: LT JONES Duty Chief: MMC(SS) SMITH

Moored port side to berth S1B, Naval Submarine Base, Pearl Harbor, Hawaii with standard mooring lines doubled. Receiving various services from the pier. Ships present include various units U.S. Pacific Fleet, and various small craft. Weather is mild with trade winds.

6103 SHIP POSITION LOG

1. **Purpose**. The Ship Position Log provides a convenient and standardized format for recording navigation positional data. This record will include all data available at any given fix/position interval.

2. **References**

(a) COMSUBLANT/COMSUBPACINST C5400. Series, Article 3223, SSBN 726 Class SSM OP61-17, SSN 688 Class SSM OP61-17 (Navigation and Piloting Bill)

3. **Format**. The Ship Position Log (OPNAV 3100/3) will be used. A sample appears on page VI-11.

4. **Instructions for Maintenance**

a. Ship’s position data shall be maintained in this log primarily for open ocean navigation. The log shall be started prior to the loss of accurate piloting positional information. Record a visual/radar fix simultaneously with all available electronic (SINS, DMINS, ESGN, LORAN, GPS, etc.) sensors to verify their accuracy prior to use. When making landfall, the log shall not be secured until firm visual/radar positional information is available and is being recorded and used at regular intervals at the Primary Plot. In all cases, ensure that transition between piloting and open ocean navigation does not omit a continuous record of ship’s track.

b. A Ship Position Log shall be maintained during all periods of open ocean navigation. During periods of classified operations, a new log will be used and afforded proper security handling. Use a line entry when shifting logs.

c. For possible track reconstruction purposes, indicate ship's track in column 22 as shown in example: Ship's "TRACK" is that position, at each regular position interval and with each fix entry, that is the best known position of the ship.

d. Whenever a fix is obtained; entries are required not only for the fix, but also for the ESGN/RLGN/SINS/DMINS estimated positions, and any other method being used to navigate the ship at the time of the fix. (R

e. Indicate with a line entry whenever positioning equipment is placed "OUT OF COMMISSION/BACK IN COMMISSION."

f. The "SHIP NAME" lines will be used to describe the ship's mission, i.e., ISE VACAPES, CLASSIFIED OPERATIONS, ADCAP CERT, PEARL HARBOR TO GUAM.

g. Duplicate Ship Position Log Sheets (OPNAV 3100/4) will be used when directed by the Navigator.

h. All fixes shall be evaluated by the OOD and either the Navigator or Assistant Navigator.

i. The individual who evaluates a fix should initial alongside the entry in the remarks column.

j. Whenever the Hand DR/DDRT Plotter, DDRT, or SINS/DMINS/ESGN/ESGM/RLGN are reset, enter an "X" in the RESET column for all position sources being reset. The OOD shall verify the correct reset himself by comparing front panel indications to positions being plotted by the Quartermaster of the Watch. Under unusual circumstances when the OOD is precluded from doing this verification, he may direct the Navigation Watch to do this verification. Whoever does this verification shall initial in the remarks column alongside the reset. (R

k. Start a new page on the start of a new day and when changing time zones.

l. Record all ESGN/RLGN/SINS/DMINS estimated positions, Hand DR, and at least one other independent source of positioning information at a minimum of each half hour. (R

m. Enter TOTAL water depth (sounding plus keel depth) when ship's position is logged and with each Fix in the remarks column. When unable to obtain an actual sounding, the charted sounding will be entered in the following manner: 200 FM-C, 200 FT-C, etc. The letter "C" indicating the recorded depth is charted vice actual. (R

R) n. Watch relief entries will be indicated by a line entry indicating the rate and name of the relieving QMOW and the QMOW being relieved.

o. Local abbreviations used in this log shall be fully explained and documented in the front inside cover of each log book.

5. **Responsibility for Maintenance**. The QMOW is responsible for the completeness, accuracy, and legibility of the Ship Position Log for his watch. He shall sign the log upon being relieved, when the log is secured upon entering restricted waters, and when shifting to/from classified Logs.

6. **Responsibility for Review and Approval**. When in use, the Ship Position Log will be reviewed at random intervals daily by the Navigator. Daily review will be indicated by a line entry and signature. The Assistant Navigator will review per Article 1102.

7. **Disposition**. When all the pages in the log are filled, it will be retained in the ship's files for one year. Classified logs will be handled as directed by the Navigator on a case basis.

SAMPLE

OPNAV 3100/3(6-76)
POSITLOG
S/N 0107-LF-031-0015

IF CLASSIFIED, STAMP SECURITY MARKING HERE

SHIP POSITION LOG

SHIP NAME: ISE

SHIP TYPE	HULL NUMBER	YEAR	MONTH	ZONE	DAY	STATION	CLASS	HANDL
N A	SSN	76	Ø1	Z	15		C	

TIME	TRACK	POSITION TYPE CODE A	QUALITY CODE B	RESET	LATITUDE DEG	LATITUDE MIN	N/S	LONGITUDE DEG	LONGITUDE MIN	E/W	REMARKS
ØØØØ		E	1		21	Ø5.2	N	158	16.4	W	
ØØØØ		E	2		21	Ø5.1	N	158	16.3	W	S/D 305° Ø.4KT
ØØØØ		V	1	X	L	21	Ø5.3	N	158	16.2	W	1723Fm
ØØØØ	X	G	P	X	L	21	Ø5.2	N	158	16.3	W	WRN-6 Fm-1
ØØØØ		X	X			21	Ø4.7	N	158	15.8	W	MK-19 DR
ØØØØ		X	X			21	Ø4.8	N	158	15.7	W	HDR
Ø415		E	1			21	Ø9.3	N	158	22.1	W	
Ø415		E	2			21	Ø9.3	N	158	22.Ø	W	S/D 296° Ø.2KT
Ø415	X	G	P	X	L	21	Ø9.2	N	158	22.1	W	WRN-6 Fm-1
Ø415		X	X		X	21	Ø9.3	N	158	22.1	W	MK-19 DR
Ø415		X	X		X	21	Ø9.3	N	158	22.1	W	HDR 1677 Fm
Ø430		E	1			21	16.1	N	158	3Ø.3	W	
Ø430		E	2			21	16.2	N	158	3Ø.3	W	S/D 3ØØ° Ø.5KT
Ø430	X	G	P	X	L	21	16.Ø	N	158	3Ø.2	W	WRN-6 Fm-1
Ø430		X	X			21	16.1	N	158	3Ø.1	W	MK-19 DR
Ø430		X	X			21	16.2	N	158	3Ø.2	W	HDR 1500Fm
Ø5ØØ	X	E	1			21	2Ø.8	N	158	41.7	W	
Ø5Ø0		E	2			21	2Ø.7	N	158	41.6	W	S/D 285° Ø.4 KT
Ø5Ø0		X	X			21	2Ø.9	N	158	41.7	W	MK-19 DR
Ø5Ø0		X	X			21	2Ø.6	N	158	41.8	W	HDR 1524 Fm
Ø523		PROPERLY REVIEWED BY ET2(SS) JONES.									
		• ET3(SS) Smith									
Ø525		REVIEWED BY NAVIGATOR, LT, USN									

IF CLASSIFIED, STAMP DOWNGRADING INSTRUCTION HERE

IF CLASSIFIED, STAMP SECURITY MARKING HERE

ANAV

6104 NAVIGATION WORKBOOK

1. **Purpose**. The Navigation Workbook provides a convenient format by which sight reduction computations can be made.

2. **Format**. The Navigation Workbook consists of prepared forms as set forth in OPNAVINST 3530.3 (series). Any computation strip used which is different from those in the current OPNAVINST 3530.3 must be approved by the Commanding Officer. Copies of these strips and the written approval for their use will be attached to and become a permanent part of the workbook in which used. Use SFMPL navigation assistance program or any other approved software is a suitable substitute for maintenance of a hard copy Navigation Workbook.

3. **Responsibility for Maintenance**. The Navigator is responsible for proper maintenance of the Navigation Workbook or computer software used for sight reductions.

4. **Responsibility for Review and Approval**. The Navigator will review and approve entries made in the Navigation Workbook or other record of sight reductions such as computer printout.

5. **Disposition**. There are no retention requirements for this data.

6105 BEARING BOOK

1. **Purpose**. U.S. Navy Regulations require ships to maintain records of observations made for the purpose of navigating the ship. The Bearing Book provides a convenient, standardized format for recording visual bearing, and radar bearing and ranges.

2. **Format**. U.S. Navy Standard Bearing Book (OPNAV 3530/2) will be used.

3. **Instructions for Maintenance**. In addition to the standard instructions contained in the front of the Bearing Book, the following additional instructions will be adhered to:

a. There will be two Bearing Books; one for the Primary Plot and one for the Secondary Plot if used.

b. For “Gyro error”, there will be three entries: Master (indicate which gyro) gyro error, transmission error, and Visual Bearing Error (VBE). VBE is the total gyro and transmission errors, which is the error actually applied to the bearings.

c. Beneath “PLACE” enter chart number.

d. NAVAIDS entered in columns (2) through (6) shall be written exactly as labeled on the chart. Each NAVAID used in each port, visual and radar, shall be assigned its own individual name. No two NAVAIDS in the same port will

have the same name. A complete list of all NAVAIDS used in each port in the book shall be kept in the back of each book and will become a permanent part of that record. Each grouping of listed NAVAIDS will be headed by the name of the port. The list will include the NAVAIDS "name" and its identification, by either its Light List/Lists of Lights number or its LAT/LONG. When verifying a buoys position and not using the buoy to fix the ship's position, only the number (Buoy 3) or short name (Buoy "NH") need be recorded.

e. The chart in use and time of chart shifts will be recorded. Bearings will be recorded as read on the bearing transmitter. Bearing error (gyro error and transmission error) will be recorded along with the means and time of determination.

f. The sounding will be recorded at the time of each fix.

g. When the ship is radar navigating using other than ranges and bearings, i.e., "Fischer Plot", where recording of data is difficult or impractical, the Secondary Plot Bearing Book will contain a line entry stating: "(Time) - Commenced radar navigating using the Fischer Plot. Ring time ___." "(Time) - Secured Fischer Plot."

4. **Responsibility for Maintenance**. During piloting, the respective Bearing Recorders will be responsible for the proper maintenance of the Bearing Books. The bearing log will be signed on the first available line by the Bearing Recorder at the end of his watch. During normal steaming watches, the QMOW shall maintain the Primary Plot Bearing Book.

5. **Responsibility for Review and Approval**. The Assistant Navigator is responsible for reviewing and approving entries made in the Bearing Books.

6. **Disposition**. Completed Bearing Books shall be classified according to content and retained in the ship's files for 1 year then destroyed.

USS ______________ NAVOPSDEPTINST 5400.___

SAMPLE

BEARING BOOK SHEET

STANDARD BEARING BOOK
OPNAV FORM 3530/9 (7-70)

RECORD GYRO BEARINGS

RED — 5 FT
YELLOW – 8 FT

HAMPTON ROADS
PLACE
CHART 12245

S/G/S GYRO ERROR Ø
MK 16 TRANS .2E
VBE .2E

DATE TIME +5	GRAIN ELEVATOR	CLOCK TOWER	SEWELLS POINT			DEPTH
8 MAR 85						
0803	098.5	047.3	009.1			22 FT
0806	098.9	048.2	009.5			22 FT
0809	122.0	055.7	010.0	POINTED TANK		21 FT
0812	139.3	NOB	011.1	070.2		20 FT
0815	147.7	045.2	013.5	BUOY 7 003.2		17 FT
0816	SET 355 DRIFT 1.2					
0818	150.2	062.7	015.3			19 FT
0820	RANGE:	017.2 (SEWELLS POINT → POINT COMFORT 017.5)				VBE .3E.
0821	Shifted To Chart 12253					
0822	PROPERLY RELIEVED BY			MM3 V. R DUNN		
				Melvin Cunan, ETSN		

6106 FATHOMETER LOG

1. **Purpose**. The Fathometer Log will contain a record of all soundings taken with the ship's fathometer.

2. **Instructions for Maintenance**. The Fathometer Log shall be maintained in accordance with the following instructions. A copy of these instructions shall be posted on the inside front cover of the Fathometer Log.

a. Sounding intervals are specified in the Navigation and Piloting Bill.

b. Each time a sounding is obtained an entry will be made in the Fathometer Log indicating date, time, time zone, keel depth, fathometer scale, sounding, and water depth (keel depth plus the sounding). Record all soundings reported to the OOD and the piloting team. Other information directed by the Navigator should be recorded in the remarks section.

c. Current **RED** and **YELLOW** soundings will be recorded at the top of each page in use and across the columns when they are changed.

d. The Fathometer Operator/QMOW will sign the log following the last entry upon securing the watch or being relieved.

3. **Responsibility for Maintenance**. The Fathometer Operator will be responsible for proper maintenance of the Fathometer Log.

4. **Responsibility for Review and Approval**. The Assistant Navigator will be responsible for reviewing the log for proper maintenance.

5. **Disposition**. The Fathometer Log will be retained in the ship's files for one year and then destroyed.

6107 CHART/PUBLICATION CORRECTION RECORD CARD FILE

1. **Purpose**. The Chart/Publication Correction Record Card System was established to reduce the amount of chart correction work aboard ship by providing a system for accumulating applicable corrections necessary to correct a chart/publication prior to its use.

2. **References**

a. Defense Mapping Agency Catalog of Maps, Charts, and Related Products, Part 2 - Hydrographic Products - Volume XII (CATP2V12)

3. **Format**. The Chart/Publication Correction Record Card (DMAHTC Form No. MISCP86609) will be used.

4. **Instruction for Maintenance**. A record card will be kept for each navigation chart and publication held onboard and maintained per the instructions contained in reference (a). If NAVINFONET is used, a card is required only for those charts not covered by NAVINFONET. Instead a computer file or hard copy record of the download should be kept which covers charts on the ship's allowance.

5. **Responsibility for Maintenance**. The Chart and Publications Petty Officer will enter corrections to the chart cards and publication cards, however, the Duty NAV ET is responsible to enter all corrections to charts and publications required for current use as received. Local area charts and those portfolios designated by the Commanding Officer will be maintained up-to-date at all times. The corrections for all other charts will be indexed and these changes entered prior to chart use. Those publications designated by the Commanding Officer will be maintained current at all times.

6. **Responsibility for Review**. The Navigation Division Leading Petty Officer will verify the completeness and accuracy of Notice to Mariners entries on the chart cards quarterly by using Notice to Mariners summaries.

7. **Disposition**. Chart/Publication cards are kept until the product is either cancel or replaced by a new edition. For new editions, ensure that temporary corrections are carried forward to the new card if they still apply.

6108 NAVAREA/HYDROLANT/HYDROPAC FILE

1. **Purpose**. NAVAREA/HYDROLANT/HYDROPACs are Long Range Radio Navigational Warnings which are designed to provide, without delay, navigational safety information concerning port and harbor approaches, coastlines or major ocean areas and are of particular concern to the U.S. Atlantic and Pacific Fleets.

2. **References**

(a) Pub 117

3. **Format**. NAVAREA/HYDROLANT/HYDROPAC messages will be maintained together. A review signature sheet and a HYDROLANT/HYDROPAC/NAVAREA in effect status sheet is attached to the front cover.

4. **Instructions for Maintenance**

a. NAVAREA/HYDROLANT/HYDROPAC messages will be delivered to the QMOW/Duty NAV ET who will ensure that they are reviewed by either the Navigation Division Leading Petty Officer or Assistant Navigator prior to filing.

b. NAVAREA/HYDROLANT/HYDROPAC messages will be filed in numerical sequence, the latest serial number at the front of the file.

c. NAVAREA/HYDROLANT/HYDROPAC messages are either self-canceling or canceled by specific notification, never dropped. Between "in force" summaries, all serialized messages must be accounted for.

d. Use of appropriate NAVINFONET data, e.g. computer file or hard copy printout, is an adequate substitute for this record. In this case, the latest serial number does not need to be at the front of the file. File any subsequent NAVAREA/HYDROLANT/HYDROPAC message on top in numerical sequence . (R

5. **Instructions for Review**

a. The Navigation Division Leading Petty Officer is responsible for review and ensuring that the NAVAREA/HYDROLANT/HYDROPAC file is maintained per this instruction and reference (a).

b. Prior to getting underway or prior to entering an unplanned subregion, the Assistant Navigator will review all (GEN) messages and messages which affect the subregion(s) in which the ship is intending to operate. Messages which affect the ship will be noted on the track charts and brought to the attention of the Navigator.

6. **Disposition**. The individual serialized NAVAREA/HYDROLANT/HYDROPAC messages will be retained until they no longer appear in either an "in force" message or a printed "in force" summary from the Notice to Mariners.

6109 NAVIGATION HAZARD MESSAGE FILE (Pacific Submarines)

1. **Purpose**. The navigation hazard message files provides the latest navigational aid discrepancies and hazards to navigation. Navigation hazard messages may be transmitted by an SUBPAC SUBOPAUTH.

2. **Format**. All navigation hazard messages will be filed together. The latest listing of effective NAVHAZARDS and a review signature sheet shall be posted in the front of the file.

3. **Instructions for Maintenance**. Navigation hazard messages will be delivered to the Navigation Division Leading Petty Officer via the Navigator. The Navigation Division Leading Petty Officer will review each message for any immediate action necessary and deliver it to the Charts and Publications Petty Officer for action and filing.

4. **Responsibility for Review and Approval**

a. All navigation hazard messages will be delivered to the Navigator upon receipt.

b. All Navigation Division personnel will review the NAVHAZARDS file and status sheet weekly and before entering each new area of operations in order to determine whether any navigation hazard messages are in effect that may influence the navigation of the ship. Personnel reviewing the NAVHAZARDS file will initial the status sheets.

c. The Navigation Division Leading Petty Officer will ensure all effective navigation hazard messages are noted and/or plotted on charts actually in use.

d. The Navigator shall route all navigation hazard messages affecting the ship's navigation to the Commanding Officer prior to the ship getting underway for sea.

5. **Disposition**. All navigation hazard messages will be maintained until the end of the effective period noted within the message or until the hazard noted is covered by another formal method of hazard notification.

6110 NOTICE TO MARINERS FILE

1. **Purpose**. Notice to Mariners, published weekly by the Defense Mapping Agency Hydrographic/Topographic Center, reports changes in aids to navigation, new sounding information and gives notice of official regulations affecting navigation. It is the official publication for the correction of charts, Sailing Directions, List of Lights and other publications of the Defense Mapping Agency and National Ocean Service. Corrections for Light Lists and other Coast Guard publications is included, but is also usually repeated in Local (Coast Guard) Notice to Mariners weekly. This information is also available via NAVINFONET, a computer bulletin board system operated by the Defense Mapping Agency. Because of publication delays, the information in the computer data base is often more current than the information in the latest published Notice to Mariners.

2. **Format**. Notice to Mariners will be filed in a suitable binder in numerical order by calendar year. If chart and publication correction information is obtained via the NAVINFONET, there is no need to maintain hard copies of the published Notice to Mariners covering the same correction information.

3. **Instructions for Maintenance**. Upon receipt of a Notice to Mariners, or within 3 working days thereafter, the Chart and Publications Petty Officer shall annotate the correction cards of all charts/publications affected by the Notice to Mariners. Use a separate line for each page of publications affected by the Notice to Mariners. Care should be exercised in accounting for "cutout" corrections to Light Lists, Lists of Lights, Radio Navigational Aids, etc., which are not summarized in the Summary of Corrections.

4. **Responsibility for Maintenance**. The Chart and Publications Petty Officer is responsible for the Notice to Mariners file.

5. **Responsibility for Review**. The Navigation Division Leading Petty Officer will review each Notice to Mariners upon receipt for information of immediate value.

6. **Disposition**

a. DMAHTC issues a Five Volume Summary of Corrections for charts, U.S. Coast Pilots, Sailing Directions, Fleet Guides and Miscellaneous Publications. Corrections for the Part 2 Hydrographic Products, Catalogs, Light Lists, List of Lights, and Radio Navigation Aids are not included. For this reason, Notice to Mariners are not automatically disposed of when published in the Summaries.

b. The Summary of Corrections Volumes assume that the latest edition of a Chart/Publication is held. New editions should be received automatically but receipt must be verified using procedures in Article 6112.

c. Three techniques are approved for ensuring the appropriate weekly Notice to Mariners are retained in addition to those required by the Summary of Corrections Volumes:

(1) Ensure all publications such as Light Lists, List of Lights, and Radio Navigation Aids whose corrections are not in the Summary of Corrections Volumes are included on the Commanding Officer’s list of charts and publications which are to be kept continuously up to date. All weekly Notices to Mariners must be retained until actual corrections to those publications are made.

(2) All weekly Notice to Mariners will be retained in the ship’s files as long as they contain outstanding corrections to required charts and publications not incorporated into the Notice to Mariners summary.

(3) The local correction information is obtained by bulletin board service and maintained in an appropriate file.

6111 BROADCAST AND LOCAL NOTICE TO MARINERS FILE

1. **Purpose**. Broadcast Notice to Mariners promulgate information affecting navigational safety within a specific Coast Guard district.

NOTE: For navigation information that is known or expected to be short duration the Broadcast Notice to Mariners may be the only source.

a. Local Notice to Mariners publish safety and general navigational information for a specific Coast Guard District. It also summarizes information concerning aids to navigation from Broadcast Notice to Mariners if still significant.

b. Many local areas have bulletin board systems which contain Local Notice to Mariners information which can be downloaded to a personal computer.

2. **Format**. Broadcast Notice to Mariners and Local Notice to Mariners will be filed numerically, however submarines will not receive all Notices. The weekly notice summary should be filed with the Notices and used to verify all required messages are onboard. A computer file or printout of current data meets the requirements of this article.

3. **Instructions for Maintenance**

a. Broadcast Notice to Mariners will be delivered to the QMOW/Duty NAV ET who will ensure that they are reviewed by the Assistant Navigator prior to filing.

b. Local Notice to Mariners will be routed to the Chart and Publication Petty Officer for filing via the Navigator and Assistant Navigator.

4. **Responsibility for Review and Approval**

a. The Navigation Division Leading Petty Officer shall ensure that all pertinent Broadcast Notice to Mariners and Local Notice to Mariners are noted or plotted on charts and publications actually in use. The Assistant Navigator shall review this procedure to ensure this information is effectively utilized.

b. Prior to the ship getting underway, the Assistant Navigator and Navigator shall review this information and the Navigator shall ensure that all Broadcast Notice to Mariners/Local Notice to Mariners which effect the ship’s navigation are routed to the Commanding Officer.

5. **Disposition**

a. Broadcast Notice to Mariners will be retained until canceled by specific notification or printed and accounted for in the Local Notice to Mariners.

b. Local Notice to Mariners will be retained until superseded.

6112 CHART AND PUBLICATION ALLOWANCE MAINTENANCE PROCEDURES

1. **Reference**

a. COMSUBLANTINST S3140.1/COMSUBPACINST S3530.2A (Chart/Pub Allowance)
b. Hydrographic Products Semiannual Bulletin Digest
c. Hydrographic Products Monthly Bulletin
d. Defense Mapping Agency catalog of Maps, Charts, and Related Products - Part 2 - Hydrographic Products

2. **Unclassified Chart and Publication Allowance Listings**

a. The Semi-annual Bulletin Digest Lists all current chart and publication editions. The Semi-annual Bulletin Digest is normally published in June and December. The Monthly Bulletin is issued in each of the other ten months and accumulates all changes that have occurred since the most recently published Semi-annual Bulletin Digest. Between Monthly Bulletins, the Notice to Mariners is used to update the Monthly Bulletin.

b. By use of references (a), (b), and (c), the ship can verify its unclassified allowance by inventory to assure that the latest editions of charts and publications are held, and to confirm the completeness of ship's holdings.

3. **Classified Chart and Publications Allowance Listings**

a. Classified charts and publications are listed in Volume XI of reference (d). Volume XI is updated and corrected by the Quarterly Bulletin and the Classified Notice to Mariners.

b. By use of reference (a) and the corrected Volume XI, the ship can verify its classified holdings.

4. **Automatic Initial Distribution (AID)**

a. The basic allowance of reference (a) is automatically supported by the DMA Automated Distributed Management System (DADMS) with AID. AID is designed to keep the ship's allowance current with no action required by the ship.

b. For items not on the basic allowance, but required/desired to be carried by the ship, enter "AID" in the remarks column of the SF 344, and subsequent new editions in the required quantities of the product will be issued automatically.

c. Annual validation of the ship's AID list is required by DADMS.

5. **Allowance**. The allowance specified in reference (a) shall be filled to 100% unless otherwise approved by the Navigator or the Commanding Officer. The Navigator shall approve holdings in excess of the allowance.

6. Procurement

a. The Chart and Publications Petty Officer will utilize the procedures of Volume XII of reference (d) in ordering charts and publications.

b. Copies of requisition documents for charts and publications will be retained until all items on each requisition have been received. Items on order which have been procured from another source should be canceled.

C. The Chart and Publications Petty Officer will maintain a chart and publication requisition log.

d. In order to expedite delivery internal to the ship, the use of "NNO 1" in space 45-50 (Supplementary Address) of Form SF 344 should be used.

e. Products not on the allowance lists, or on board but not in sufficient quantity to support a specific mission or area of operation, will be requisitioned through the squadron.

f. The Repair Parts Petty Officer shall not duplicate entries in the RPPO Log for charts and publications.

6113 SHIP'S POSITION REPORT

1. Purpose. The Ship's Position Reports provide a means of reporting the R) ship's position to the Commanding Officer at prescribed intervals. I Administration of this report should be kept to a minimum. It should not distract the QMOW from his primary duties of safe navigation.

2. Format. Ship's Position Report, NAVSHIPs Form 9240/I(REV 3-74), or a locally prepared report which includes all the data specified on NAVSHIPs Form 9240/1 (REV 3-74), will be used. A sketch showing all ship's positions (EP, R) DR, DRAI, etc.) and positional uncertainty size may be included on this I report. A sample is provided on page VI-23. The sketch may appear on the back of the report.

R) 3. Instructions for Maintenance. Each day at sea prior to 0800, and 2000 I (local) the Assistant Navigator will prepare or cause to have prepared in duplicate a Ship's Position Report. After the Navigator has signed the Position Report the original copy will be delivered to the Commanding Officer at the appropriate time. Ensure that the correct security classification of the report is indicated thereon.

4. Responsibility for Maintenance. The Assistant Navigator is responsible for maintaining the file of duplicate Ship's Position Reports.

5. Responsibility for Review and Approval. The Navigator is responsible for reviewing the ship's Position Reports and approving them by signature prior to their submission to the Commanding Officer.

6. Disposition. Retention of copies of positions reports is not required

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SAMPLE

BEARING BOOK SHEET

STANDARD BEARING BOOK
OPNAV FORM 3530/9 (7-?)

RECORD GYRO BEARINGS

RED – 5 FT
YELLOW – 8 FT

PLACE: HAMPTON ROADS
CHART 12245

SINS GYRO ERROR: Ø
MK 116 TRANS: .2E
VBE: .2E

DATE TIME	GRAIN ELEVATOR	CLOCK TOWER	SEWELLS POINT			DEPTH
8 MAR 85						
0803	098.5	047.3	009.1			22 FT
0806	098.9	048.2	009.5			22 FT
0809	122.0	055.7	010.0	POINTED TANK		21 FT
0812	139.3	NOB	011.1	070.2		20 FT
0815	147.7	045.2	013.5	BUOY 7 003.2		17 FT
0816	SET 355	DRIFT 1.2				
0819	150.2	062.7	015.3			19 FT
0820	RANGE:	017.2 (SEWELLS POINT →		POINT COMFORT 017.5)		VBE .3E.
0821	Shifted To	Chart 12253				
0822	PROPERLY	RELIEVED BY		MMS3 V. R.	DUNN	
				Melvin [illegible], ETSN		

6114 COMMUNICATIONS LOG

1. **Purpose**. The Communications Log is a record of all underwater and visual communications.

2. **Maintenance, Format, and Disposition**. The Communications Log shall be maintained and disposed of per instructions issued by the Navigator.

a. The Log is maintained in an 8″ x 10 1/2″ standard issue bound journal. A copy of this appendix shall be mounted in the front of the log.

b. This log must not contain the meaning of any coded signals.

c. Non-tactical message traffic must contain a date-time-group and should be logged accordingly. Additionally, the log should contain information on all noteworthy events that affect the communications watch.

EXAMPLE - COMMUNICATION LOG

Date_____

GMT/ TOR/ TOT	ADDRESSEE	ORIGINATOR	TEXT

3. **Responsibility for Maintenance**. The Navigation Leading Petty Officer will be responsible for the proper maintenance of the log. The Officer of the Deck is responsible for reviewing and approving entries made in the log when used.

4. **Disposition**. The communications log will be disposed of as directed by the Navigator.

6115 TRAINING RECORDS. Department training records shall be maintained per COMSUBLANT/COMSUBPAC Training Manual.

6116 SSBN OPERATIONS LOG/REFTRA LOG

1. **Purpose**. The Refresher Training (REFTRA) period and patrol period comprise SSBN special operations which OPNAVINST 3100.7 has specifically directed SSBN's not to enter operational data in the Ship's Deck Log. During these periods operational data will be recorded in SSBN Operations Logs.

2. **Format**. The format for these logs are contained in COMSUBLANT/ COMSUBPACINST C3890.2 (LANT)/C3480.1 (PAC).

3. **Instructions for Maintenance**. The SSBN Operations Logs shall be maintained per the instructions in COMSUBLANT/COMSUBPACINST C3890.2/.1 and Article 6101 of this chapter.

4. **Responsibility for Maintenance**. The OOD shall supervise the keeping of these logs and shall require that all required information be entered accurately and chronologically. He shall sign the appropriate log upon being relieved.

5. **Responsibility for Review and Approval**. The Navigator shall review these logs and shall sign them at the conclusion of the special operations. He will submit the logs to the Commanding Officer at the conclusion of the special operations for his approval.

6. **Disposition**. Disposition instructions are provided by COMSUBLANT/ COMSUBPACINST C3480.2 (LANT)/C3480.1 (PAC).

6117 CURRENT OPERATIONS BINDER

1. **Purpose**. The Current Operations Binder will be used to provide a readily available source of all operational traffic which effects the ship during any scheduled underway period.

2. **Format**. The Current Operations Binder will consist of a notebook divided into appropriate sections containing information regarding the ship's current operations. As a minimum the following sections are recommended: Current OPORD, Advisories/Navigation Hazards (located on charts in use), Current OPSKED, MOVORD/SUBNOTE, Mutual Interference.

3. **Responsibility for Maintenance**. The Navigator is responsible for proper maintenance of the Current Operations Binder. The Assistant Navigator is responsible for the correct plotting of all pertinent information posted in the Current Operations Binder.

4. **Responsibility for Review and Approval**. The Navigator will be responsible for the review and posting of pertinent information in the Current Operations Binder. The Navigator and Assistant Navigator will review the Current Operations Binder at least daily. Prior to relieving the watch, each oncoming QMOW and OOD will review the Current Operations Binder for all activities scheduled for their watch plus two hours.

5. **Disposition**. When all operations are complete and the ship is safely moored, contents of the Current Operations Binder may be disposed of as directed by the Navigator.

6118 OTHER LOGS AND RECORDS. Other logs and records required to be kept by the Navigation/Opearations Department are to be maintained per applicable instructions. Instructions for these logs and records are sufficiently detailed and standardized to warrant their exclusion from this instruction. Other records include, but are not limited to, Data Requirements specified in the Navigation Operating Procedures (NOPS). The additional logs required to be maintained for the Trident command and Control System Data Package (TRICCSMA) can be found in NAVSEA S9SSB-X9-INS-010, SSBN 726 Class Submarine Command and Control System Data Collection, Packaging and Off-loading Procedures.

R) **6119 STRATEGIC NAVIGATION DAILY SUMMARY**. A Strategic Navigation summary is recommended for daily forwarding to the Commanding Officer. A sample is provided on page VI-27 and VI-28.

SAMPLE STRATEGIC NAVIGATION DAILY SUMMARY (NON-TNCP)

Date: _____ Time Prepared: _____

1. Equipment Line-up:

	SINS 1	SINS 2	ESGM	CP890#1	CP890#2	CP890#3
Master SINS/CNC	_____	_____		_____	_____	_____
Damping Selected	_____	_____	____	_____	_____	_____
Power Source	_____	_____		_____	_____	_____

NAV BUS Powered from: _____

2. Equipment out-of-CornmisSiOn:

3. Significant Abnormal Conditions:

4. Next fix required by (date/time) : _____
Next fix desired by (date/time) : _____
LORAN monitoring available? _____ Last Sync:

5. Operating under: PG2 _____ PG3 _____

6. Remarks/comments:

_____
Navigator

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STRATEGIC NAVIGATION DAILY SUMMARY (TNCP)

Date: _____ Time Prepared: _____

1. Equipment Line-up:

Master ESGN	_____/Mode:	_____
Secondary ESGN	_____/Mode:	_____
Master IFU	_____/Mode:	_____
Master IFS	_____/Mode:	_____

Program(s) Running:

	CPUl/CPU2
MP 1	_____/_____
MP 2	_____/_____
	_____/_____
MP 4	_____/_____
MP 5	_____/_____
MP 6	_____/_____

2. Power Line-up:

3SF	Bus 1:	_____	Bus 2:	_____
1SFA	Bus 1:	_____	Bus 2:	_____

3. Equipment out-of-commission:

4 Significant Abnormal Conditions:

5 Next fix reauired by (date/time) : _____
Next fix desired by (date/time) : _____

6. Operating under: PG 1 / 2

7. Remarks/Comments:

_____
Navigator

6120. SUBMARINE RADAR LOG (OPNAV 3100/22).

1. **Purpose.** The Submarine Radar Log is a record of radar operational status and radar contact information. A separate Submarine Radar Log will be maintained for each radar on board the ship, commercial or military.

2. **Format.** The Submarine Radar Log will consist of a folder containing standard Submarine Radar Log pages (OPNAV 3100/22). The cover of the log will clearly identify the applicable radar (i.e. AN/BPS-15G, FURUNO 2300). Log entries will be made in chronological order in accordance with the entry instructions on the back of the log sheet (OPNAV 3100/22). A new page will be used for each day an entry is required (operation or maintenance). All contact entries will include bearing and range to the contact at the time of the entry. As a minimum, the following entries will be made.

a. Radar ON, OFF and standby times. (EVENT code: ON, OFF or STNBY)

b. Radar maintenance periods. (EVENT code: DOWN - maintenance started, EVENT code: UP - maintenance complete.)

c. Radar operating in reduced status. (EVENT code: IMPRD)

d. Gain of any new radar contact or regain of a lost contact. (EVENT code: GAIN or RGAIN)

e. Loss of a radar contact. (EVENT code: LOST) Lost contact entries are not necessary when the radar is turned off or placed in standby, however, contact gain or regain entries must be made when the radar is subsequently turned on.

f. Any time tracking of a contact is secured. (EVENT code: SCRUB) The operator will only secure tracking contacts as directed by the Contact Coordinator or OOD.

g. Record calculated CPA and changes in CPA. (EVENT code: leave blank) This entry can be combined with the "SCRUB" entry when applicable.

h. Time contact reaches CPA. (EVENT code: CPA)

i. Contact range and bearing information at a frequency designated by the Contact Coordinator or OOD (i.e. every three minutes) for all contacts not scrubbed. (EVENT code: leave blank)

3. **Responsibility for maintenance.** The Radar Operator or Navigation Watch is responsible for the neatness, accuracy and completeness of this log at sea. The Duty Navigation Electronics Technician will maintain this log during inport maintenance and operation or at anchor.

(A

A) **4. Responsibilitv for review. The Navigation Division Leading Petty Officer will review this log weekly when the radar has been in use for neatness, accuracy and completeness. The Navigator will periodically review the log for proper maintenance.**

5. Disposition. The Submarine Radar Log will be retained for one year and then destroyed.

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SAMPLE

OPNAV 31[illegible]2 (9-75)
SS RADLOG S/N 0107-LF-031-0110

SUBMARINE RADAR LOG

IF CLASSIFIED, STAMP SECURITY MARKING HERE

P	A	SHIP TYPE	HULL NUMBER	SHEET SERIAL	YEAR	MONTH	ZONE	DAY		SHIP NAME	CLASS	HANDL
P	A	SSN	774	01	8	01	Z	15	G	USS SUBMARINE	C	
1	2	3-4	5 - 7	10-11	12	13-14	15	16-17	22		78	79

TIME (HR. MIN. SEC.)	EVENT	SCAN CIR	SCAN SEC	RANGE SCALE	CONTACT NUMBER	CONTACT BEARING	CONTACT RANGE	REMARKS
0400	ON	X		30				RING TIME: 4800 YDS
0403	GAIN				1	050	18000	
0403	GAIN				2	310	15000	
0409					1	055	16500	CPA: B-107°T, R-10.3kyds, T-0948
0409					2	324	12800	CPA: B-351°T, R-11kyds, T-0917
0410				6				
0412				30				
0415					1	060	15000	
0415					2	343	11100	
041728	CPA				2	351	11000	
0420				6				
0421				30	1	066	13800	
0421					2	003	11200	
0427					1	072	12500	
042744	SCRUB				2	022	12600	
0430				6				
0432				30				
0433					1	081	11400	
0439					1	090	10900	
0440	PROPERLY RELIEVED BY ET3(SS) DAVIS							T.M. Smith ET2(SS)

IF CLASSIFIED, STAMP DOWNGRADING INSTRUCTION HERE

IF CLASSIFIED, STAMP SECURITY MARKING HERE

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CHAPTER VII

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ELECTRONIC NAVIGATION MONITORING

7100 Introduction

1. This chapter is applicable to submarines with the AN/BPS-15H **radar upgrade** employing the Sperry Voyage Management System (VMS). The Sperry Voyage Management System and the SPAWARSYSCOM Full Utility Navigational Display (FUND) are currently the only approved Digital Nautical Chart (DNC) display systems for use in submarines. Ships that do not yet have the VMS installation complete, but have the SPARWARSYSCOM Full Utility Navigational Display (FUND) system should use the principles of this chapter for employment of that system except for the requirement to operate the system continuously.

2. Electronic Navigation on any system is not yet an approved method for tracking and evaluating ship's position. VMS and FUND are navigation monitoring systems only. The primary means for fixing ship's position and evaluating proximity of hazards remains as the manual primary chart prepared and employed in accordance with the previous chapters of this manual. **The VMS provides a continuous correlation of the navigation picture with the radar contact picture and is a primary tool for contact management.** The navigation display may be used as a reference to aid the Navigator and the Officer of the Deck in safely maneuvering the ship to avoid fixed and mobile hazards to navigation. The primary chart, approved by the Commanding Officer, remains the official source for the Navigator's recommendations on safe navigation and is the legal record of ship's track.

3. There is little operational experience related to the use of VMS on submarines. The following initial guidance is considered as a minimum requirement.

7101 Manninu Reuuirementp

1. The VMS will be operated continuously when a NIMA Digital Nautical Chart for the area of operation is available. If a NIMA DNC is not available for the area of operation, a NOAA or British Admiralty Electronic Nautical Chart (ENC) may be used. These charts **may** not be used **in areas with NIMA DNC coverage.**

2. There are two remote display control stations: the Primary Plot station **and the Secondary** Plot station. When piloting or in restricted waters, both of these stations will be manned by a Display Operator. The **Display Operator** may be assigned other duties in the piloting party at the discretion of the

Navigator. When in open ocean, the Secondary Plot display may be secured and the Primary Plot display operated in an unmanned condition. The remote displays on the bridge and in the CO Stateroom are slaved to the primary plot control station.

3. When operated in conjunction with the AN/BPS-15H radar, a radar operator will be stationed at the radar control console.

7102 Voyage Management System Preparation and Employment

1. Load the appropriate DNC into the VMS along with any correction or Tactical Oceanographic Data (TOD) compact discs. Set up manually entered track waypoints and danger areas following the principles outlined in Chapter V.

2. Waypoint entries and danger area selection must be reviewed and approved by the Navigator and must match the CO approved track on the Primary Chart. Waypoint entries will be recorded on an appropriate data sheet.

3. GPS from the AN/WRN-6 is the preferred input for ownship position. Backup fix source input is commercial GPS. If GPS is not available, select input to master ESGN/RLGN.

7103 Record Retention

1. The VMS continuously records data for ship's position and parameters. This information should be transferred to disk and saved for one year. The disk will be labeled with the ship's name, hull number, inclusive dates for data stored, and appropriate classification.